WHY THEY FLY: AN EXPECTANCY-BASED ANALYSIS OF THE FACTORS THAT MOTIVATE COMMISSIONED ARMY AVIATORS TO GAIN FLYING EXPERIENCE

A thesis presented to the Faculty of the U.S. Army
Command and General Staff College in partial
fulfillment of the requirements for the
degree

MASTER OF MILITARY ART AND SCIENCE
General Studies

by

TODD H. MARSHBURN, MAJ, USA
Ed.S., The Florida State University, Tallahassee, Florida, 2003
M.S., The Florida State University, Tallahassee, Florida, 2003
B.S., The United States Military Academy, West Point, New York, 1994

Fort Leavenworth, Kansas
2007

REPORT DOCUMENTATION PAGE

Form Approved
OMB No. 0704-0188

1. REPORT DATE *(DD-MM-YYYY)*
15-06-2007

2. REPORT TYPE
Master's Thesis

3. DATES COVERED *(From - To)*
Aug 2006 - Jun 2007

4. TITLE AND SUBTITLE
Why They Fly: An Expectancy-Based Analysis of the Factors that Motivate Commissioned Army Aviators to Gain Flying Experience

5a. CONTRACT NUMBER

5b. GRANT NUMBER

5c. PROGRAM ELEMENT NUMBER

6. AUTHOR(S)
Marshburn, Todd H., MAJ, U.S. Army

5d. PROJECT NUMBER

5e. TASK NUMBER

5f. WORK UNIT NUMBER

7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES)
U.S. Army Command and General Staff College
ATTN: ATZL-SWD-GD
1 Reynolds Ave.
Ft. Leavenworth, KS 66027-1352

8. PERFORMING ORGANIZATION REPORT NUMBER

9. SPONSORING / MONITORING AGENCY NAME(S) AND ADDRESS(ES)

10. SPONSOR/MONITOR'S ACRONYM(S)

11. SPONSOR/MONITOR'S REPORT NUMBER(S)

12. DISTRIBUTION / AVAILABILITY STATEMENT

Approved for public release; distribution is unlimited.

13. SUPPLEMENTARY NOTES

14. ABSTRACT Recent changes to Army publications have emphasized the importance of gaining flying experience, particularly in earning designation as pilot-in-command, for commissioned Army aviators. Based on those changes, this study evaluated the factors that motivate commissioned Army Aviators to gain flying experience. A sample of 44 aviators participated in the study. It was hypothesized that commissioned Army aviators were more intrinsically motivated (e.g., seeking competence, skill, challenge, and enjoyment) than extrinsically motivated (e.g., seeking master aviator badge, command selection, recognition from others, and promotion) to gain flying experience. A paired samples t-Test indicated that participants were more intrinsically motivated. Multiple regression analyses, however, indicated that intrinsic motivation did not significantly contribute to the prediction of either total flight hours or pilot-in-command hours. Since gaining this flying experience is considered a function of an aviator's self-development, and since intrinsic motivation is related to participation in self-development programs, implications of these findings were offered. Specifically, implications associated with barriers to self-development and recommendations for future research were identified.

15. SUBJECT TERMS
Intrinsic Motivation, Expectancy Theory, Self-Development, Army Aviator, Flying Experience, Pilot-in-Command

16. SECURITY CLASSIFICATION OF: a. REPORT	b. ABSTRACT	c. THIS PAGE	**17. LIMITATION OF ABSTRACT**	**18. NUMBER OF PAGES**	**19a. NAME OF RESPONSIBLE PERSON** / **19b. TELEPHONE NUMBER** *(include area code)*
Unclassified	Unclassified	Unclassified	UU	83	

Standard Form 298 (Rev. 8-98)
Prescribed by ANSI Std. Z39.18

MASTER OF MILITARY ART AND SCIENCE

THESIS APPROVAL PAGE

Name of Candidate: MAJ Todd H. Marshburn

Thesis Title: Why They Fly: An Expectancy-Based Analysis of the Factors that Motivate Commissioned Army Aviators to Gain Flying Experience

Approved by:

____, Thesis Committee Chair
Kenneth J. Riggins, M.A.

____, Member
Bill McCollum, Ed.D.

____, Member or Consulting Faculty
Ricky J. Steele, M.S.

Accepted this 15th day of June 2007 by:

____, Director, Graduate Degree Programs
Robert F. Baumann, Ph.D.

The opinions and conclusions expressed herein are those of the student author and do not necessarily represent the views of the U.S. Army Command and General Staff College or any other governmental agency. (References to this study should include the foregoing statement.)

ABSTRACT

WHY THEY FLY: AN EXPECTANCY-BASED ANALYSIS OF THE FACTORS THAT MOTIVATE COMMISSIONED ARMY AVIATORS TO GAIN FLYING EXPERIENCE by Major Todd H. Marshburn, USA, 83 pages.

Recent changes to Army publications have emphasized the importance of gaining flying experience, particularly in earning designation as pilot-in-command, for commissioned Army aviators. Based on those changes, this study evaluated the factors that motivate commissioned Army Aviators to gain flying experience. A sample of 44 aviators participated in the study. It was hypothesized that commissioned Army aviators were more intrinsically motivated (e.g., seeking competence, skill, challenge, and enjoyment) than extrinsically motivated (e.g., seeking master aviator badge, command selection, recognition from others, and promotion) to gain flying experience. A paired samples t-Test indicated that participants were more intrinsically motivated. Multiple regression analyses, however, indicated that intrinsic motivation did not significantly contribute to the prediction of either total flight hours or pilot-in-command hours. Since gaining this flying experience is considered a function of an aviator's self-development, and since intrinsic motivation is related to participation in self-development programs, implications of these findings were offered. Specifically, implications associated with barriers to self-development and recommendations for future research were identified.

ACKNOWLEDGMENTS

I have heard that pilots track their lives one hour at a time. Perhaps the same could be said for researchers. In fact, hours are spent reviewing theory, evaluating published studies, reading books, and re-acquainting oneself with exacting statistical concepts, only to face the daunting task of spending many more hours writing something that deserves the attention of potential readers. Quantitative research, like many things, can be enjoyable or it can be a laborious process riddled with frustration. The following thesis, fortunately, is the result of the former. It was truly an interesting and exciting study to conduct. It would not have been possible, however, without the help and support of those whom I would like to formally thank below.

I would first like to thank my fellow Army aviators attending the Command and General Staff Officer Course for participating in this study. Without their responses, this research would not have been possible.

I would also like to thank my family, especially my wife, for providing me the encouragement to continue this line of research. Without her willingness to provide me the time and the solitude to write, I would not have finished on time.

Finally, and most importantly, I would like to thank my committee, Mr. Ken Riggins, Mr. Rick Steele, and Dr. Bill McCollum. I sincerely appreciate their willingness to take time from their schedules, their interest in the study, and the valuable guidance they provided throughout this process. Without their enormous support, this research would have remained only an idea.

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CHAPTER 1

INTRODUCTION

> Great pilots are made not born. . . . A man may possess good eyesight, sensitive hands, and perfect coordination, but the end result is only fashioned by steady coaching, much practice, and experience. (1998, p. 180)

Air Vice Marshal James Edgar Johnson, *Slipping the Surly Bonds*

All United States Army aviators are pilots. As such, it may appear that they would fly throughout their careers. However, this thought is unfounded, especially for commissioned Army aviators. In fact, due to the nature of their career development, commissioned Army aviators will often serve in general, non-flight assignments. In other words, gaining flight experience is not their only occupational requirement. Flying constitutes only a small portion of the commissioned Army aviator's responsibilities that include leading, managing, training, and performing various administrative functions. Although these responsibilities are necessary, the time spent outside the cockpit may undermine an aviator's opportunity to gain flight experience and to increase his or her overall flying proficiency and skill.

Within the past several years, senior Army leaders and aviation officers have expressed some concern over the possibility that aviators were not gaining the optimal level of flying experience. According to Quackenbush (2000), the de-emphasis of flight-related skills for commissioned Army aviators resulted in a dramatic decrease in overall flight experience for commissioned officer aviators. For example, in the late 1980s, battalion commanders typically had logged an average of 2,000 flight hours, while in the late 1990s "lieutenant colonels [were] taking command with an average of only 1,000 hours and this figure [was] expected to drop to approximately 700 in the next few years" (Quackenbush, p. 2).

Recognizing this trend and its implications for mission effectiveness and leadership effectiveness, the Army revised its career-development model for commissioned officer aviators in 2005. Although the guidance maintained much of its language in terms of non-flying responsibilities, it changed significantly with respect to flying experience. Specifically, the revised guidance articulated specific flying hour benchmarks for flight experience that it previously lacked. Interestingly, the career-development model places the burden of attaining these benchmarks squarely on the individual aviator by stating that they can attain these benchmarks through self-development. As the term self-development implies, it is the individual officer who must strive to gain this experience, no matter the assignments in which they serve. In other words, this experience is not guaranteed and in order to realize it, the officer must maximize the opportunities to fly when they arise.

In addition to the revised career development model, the flight experience of commissioned officers may have implications for selection to command at higher levels. According to General Richard Cody, the Vice Chief of Staff of the Army, Army leadership is giving some consideration to providing guidance for battalion level and brigade level command selection boards "with respect to minimum pilot qualifications and experience level for command selectees in order to enhance the tactical and technical competence of our aviation commanders in the field" (Vice Chief of Staff of the Army [VCSA], 2005, ¶ 7).

With these recent issues in mind, it is quite clear that the Army now places a premium on the flying experience of commissioned officer aviators. It is, therefore, important to determine whether or not aviators will embrace this new emphasis. Stated another way, it is valuable to evaluate whether or not aviators feel that gaining this flying experience is instrumental to their careers as Army officers. As such, this study seeks to quantify the relative importance commissioned officer aviators place on gaining flying experience. In doing so, the study will extend previous research and explore "whether competence in flying is related to their [commissioned officer aviators] feelings of competence as an Army officer" (Marshburn & Rollin, 2005, p.85).

Primary Research Question

To evaluate whether commissioned Army aviators will embrace the new career development guidance and engage in self-development to gain flying experience, this research seeks to answer the question, What factors motivate commissioned officer aviators to gain high levels of flying experience? From this primary research question, three subordinate questions emerge. In order to fully develop this study, each of these questions needs attention.

Subordinate Research Questions

In seeking to determine the factors that motivate commissioned Army aviators to gain high levels of flying experience, it is necessary to first operationalize the concept of flying experience in general, and a high level of flying experience, in particular. Therefore, the first subordinate question this research will address is, What is considered a high level of flying experience? To answer this question, the researcher will provide information from both Army regulations and civil aviation authorities in order to establish concepts of flying proficiency, competence and experience. By describing these concepts, the researcher will describe the rubrics of flying experience that differentiate basic levels from expert levels of experience.

Through establishing a common framework of flying experience, it is possible to establish the relationship of flying experience to a commissioned Army aviator's occupational milieu. In doing so, the second subordinate question that this research will address is, How does flying experience actually relate to a commissioned officer aviator's career as an Army officer? To answer this question, the researcher will describe the career development model for these aviators. Specifically, the researcher will contrast the previous career development guidance to the revised guidance, with explicit emphasis on flying skills and experience as it relates to self-development.

With this information in mind, and since gaining flying experience is considered a function of self-development, it is necessary to operationalize the concept of self-development and to identify the factors that motivate individuals to engage in self-developmental activities. As such, the third subordinate question this research will address is, How is self-development related to motivation? To answer this question, the researcher will offer theoretical information about self-development and its relationship to current theories of motivation as described in the organizational behavior and psychological sciences literature.

CHAPTER 2

LITERATURE REVIEW

This study seeks to provide insight into the factors that motivate commissioned Army aviators to gain high levels of flying experience, in spite of the many competing demands of their other occupational responsibilities. To develop appropriate hypotheses for statistical analysis, the theoretical underpinnings of this study require elaboration. As such, the purpose of this chapter is threefold.

First, in analyzing the factors that motivate commissioned Army aviators to gain high levels of flying experience, it is necessary to operationalize not only the concept of high levels of flying experience, but also to review the commissioned Army aviator's career development model and its linkage to gaining this flying experience. Second, since gaining flight experience is largely considered a function of self-development, it is necessary to review contemporary theoretical information on the concept of self-development, in general, and the factors associated with a person's likelihood to engage in self-developmental activities, in particular. Third, the concept of motivation and its relationship to self-development is important in the development of the variables of interest. As such, each of these topics is introduced below.

The Concept of Flying Experience

According to Goh and Wiegmann (2002), pilots with high levels of flying experience are typically more confident in their abilities to react to emergencies while airborne. Flying experience, however, is difficult to quantify. In fact, "studies that have investigated the role of flight experience in the performance of flight-related tasks have used and shown different measures to be important" (p. 1). For example, Guilkey (1997) asserted that a pilot's total flight time is a fairly accurate predictor of competence and skill when evaluating those tasks required for every flight (e.g., takeoff and landing), but when analyzing other flight-related situations, it is not the only predictor of aviator expertise. Instead, a pilot's level of certification is also useful. As such, a pilot's flying experience not only involves their total aggregate flying time, but also includes their level of certification or unique designations that they have earned.

Total Flight Hours

For pilots, competence and expertise in aviation has often been based on the total number of flight hours they have actually flown. In fact, without certain levels of flight hours, pilots often face restrictions in the types of flying activities they can actually perform. Simply, pilots with less than a prescribed level of flight hours are considered novices while those above a certain benchmark are considered experts. More importantly, a pilot's total flight hours are associated with safety and, as such, it is one of the major issues involved in hiring pilots for flying jobs within the civilian aviation community.

Within the civilian helicopter business sector, for example, 1,500 flight hours is considered the minimum level of experience necessary for entry-level employment (McSkimming, n.d.). Although Federal Aviation Administration (FAA) minimums require that pilots need only 500 total hours under Federal Aviation Regulation (FAR) Part 135, insurance companies are often reluctant to insure pilots with less than 1,000 hours and often require many more (Kocks, 1999). Of course, these requirements are not arbitrarily determined. Instead, the seemingly high requirements are based on historical data linking a pilot's total flight hours to their risk of aircraft mishaps.

One of the most common areas of research that measures substantive differences in total flight hours involves analyzing aircraft accidents. In many of these research studies, a pilot's total flight hours are a major area of consideration. For example, according to Moroze and Snow (1999) controlled flight into terrain (CFIT) accidents, where the crew unintentionally flies the aircraft into the earth or a man-made obstacle, typically occur due to pilot error. A lack of situational awareness (e.g., knowing what is happening and an ability to forecast the factors affecting aircraft at any moment in time) accounts for the largest factor in these accidents attributed to pilot error. Understanding this trend, the researchers evaluated pilot experience and its relationship to these accidents. They determined that pilots with between 300 to 500 flight hours had significantly more CFIT mishaps than pilots with between 1000 to 2000 flight hours. From this data, the researchers concluded that the reduced number of CFIT accidents for the pilots with more flight hours was based on the behavior patterns that result from experience (Moroze & Snow, 1999)

Extending the previous CFIT research and attempting to quantify flying behaviors that could differentiate novice pilots from expert pilots, Kansarskis and colleagues (2001) evaluated eye scanning during the landing phase of flight as a performance metric. In selecting the sample of experts, the researchers' criterion was a function of total flight hours. Specifically, the expert pilots had flown a minimum of 1,500 flight hours. Compared to the novice pilots, who had logged less than 70 flight hours, the expert pilots demonstrated a statistically significant difference in scan pattern (e.g., stronger and more defined) resulting in better maintenance of airspeed and landing precision.

More recently, a study conducted by the Aircraft Owners and Pilots Association found that there was a correlation between pilot flight hours and the likelihood of aircraft accidents. Specifically, in reviewing all of the aircraft accidents from 1993 until 2003, pilots with less then 500 hours of flying experience accounted for the most accidents, while pilots with between 2000 and 2500 hours accounted for the fewest accidents. Further, the study revealed that the total number of flight hours logged by a pilot is the best indication of safety (Chabot, 2004).

Pilot Certification

Although the importance of a pilot's total flight hours is an important factor with respect to flight safety, the certification level of the pilot is also important in differentiating pilots with high levels of flying experience from those with low levels of flying experience. These certifications include pilot licenses, designations, and authority to operate as a pilot-in-command (e.g., the pilot responsible for the operation and safety of the aircraft during the flight). This holds true for both civilian and military pilots. In fact, both the FAA and the United States Army have clearly specified benchmarks with respect to unique certifications.

Federal Aviation Administration Regulations. The FAA is the United States' governmental agency that regulates and administers all aspects of civil aviation operations within the United States. In this capacity, the FAA not only issues and enforces regulations, but also certifies pilots. Each level of pilot certification requires that a prospective certificate holder have a minimum level of flight experience (in hours), successfully complete a written examination appropriate for the level of certification, and demonstrate flying proficiency in specific maneuvers during a practical, hands-on, flying evaluation (FAA, 2006).

The first level of certification granted by the FAA is the private pilot certificate. Essentially, this certification is the foundation upon which all other pilot certifications are built. As such, prospective pilots can attain it with the lowest level of flying experience. Specifically, eligibility for the private pilot certificate requires a prospective candidate have only a minimum of 40 flight hours. Earning privileges as a private pilot allows the certificate holder to act as a pilot-in-command for the type of aircraft for which the certificate is held. Private pilots cannot, however, receive compensation for flying (FAA, 2006, FAR 61 Subpart E).

The second level of FAA certification is the commercial pilot certificate. This certificate allows a pilot to receive compensation for flying for commercial purposes. In doing so, the commercial pilot is expected to possess a higher level of expertise than that of the private pilot. As such, the focus of earning the commercial pilot certificate involves both a higher understanding of aircraft systems and a higher skill level of flying. Eligibility for the commercial pilot certificate requires a minimum of 250 hours of flying experience. Of these 250 minimum flight hours, 100 hours must be as the pilot-in-command (FAA, 2006, FAR 61 Subpart F).

The airline transport pilot certificate, the third and highest level of pilot license granted by the FAA, serves as a prerequisite for acting as a pilot-in-command in airline operations. Subsequently, pilots seeking the airline transport pilot certificate are tested to the highest standards of both piloting ability and aviation knowledge. Based on these high standards, as compared to both the private pilot and the commercial pilot certificates, the airline transport pilot certificate requires a much greater level of flying experience. Specifically, eligibility for the airline transport pilot certificate requires a minimum of 1,500 hours of flying experience. Of these 1,500 minimum hours, at least 250 must be as the pilot-in command (FAA, 2006, FAR 61 Subpart G).

United States Army Regulations. Although the Army does not provide aviators with pilot licenses, FAR Part 61.73 includes a provision that all military pilots can earn a commercial pilot license through successfully completing the written test, without the hands-on practical flying evaluation (FAA, 2006). This provision essentially serves to demonstrate that military aviators, by virtue of their initial training programs, have the requisite flying experience to satisfy the requirements of the commercial pilot license. There is no requirement, however, for Army aviators to actually seek FAA licensure, commercial pilot or otherwise. Instead, the Army uses the award of different aeronautical badges to differentiate aviators in terms of flying experience.

As newly trained Army aviators complete initial flight training, they earn the basic aviator badge. Over time in operational assignments and through the accumulation of flight experience, they may earn variations of this badge, namely the senior aviator badge and the master aviator badge. Specifically, to earn the distinction of "senior aviator" and wear the senior aviator badge, the pilot must have flown 1000 hours and completed at least 84 months of operational flying duty. To earn the "master aviator" designation and wear the master aviator badge, however, the pilot must have flown at least 2000 hours and completed at least 120 months of operational flying duty (Headquarters Department of the Army [HQDA], 1994).

Of course, simply flying a certain number of hours and completing a specified amount of time in operational flying duty positions does not necessarily equate to certain level of proficiency or expertise. Realizing this, the Army established policies whereby those aviators who are highly skilled pilots and possess excellent decision-making skills while flying can earn distinction. Through earning the designation of pilot-in-command (PC), Army aviators are seen as experts, regardless of their total flight experience. Unlike the FAA where a certified pilot can function as a pilot-in-command within the limits of their certification level immediately after a certification is earned, the Army is much more selective in providing this designation. Army aviators earn it only after recommendations from other PCs and multiple satisfactory flying evaluations. Not surprisingly, Quackenbush (2000) offered:

> being designated a PC is a watershed event in any [Army] aviator's life…it is the rite of passage when one becomes differentiated from a less-experienced copilot to one who must have the necessary tactical and technical skills, judgment, and aptitude to serve as aircraft commander entrusted with the lives of a crew and a multimillion dollar Army aircraft. (p. 1)

Per HQDA (1997), PCs have the responsibility and final authority for operating, servicing, and securing the aircraft they command. They are in charge of every aspect of the flight mission, including the copilot, the crew, and any passengers. Additionally, the Vice Chief of Staff of the Army mandated that only PCs serve as briefing officers to authorize the conduct of missions and that battalion and brigade commanders need to require their company commanders to attain PC status prior to deploying for combat (VCSA, 2005). Simply, for commissioned officer aviators serving as commanders, "being a pilot in command allows that commander to be in-the-fight and to direct critical assets where needed" (HQDA, 2005, p. 117). Of course, "not all aviators possess the skills required for this designation" (HQDA, 2006, p. E-7) and, upon earning PC designation, the aviator's competence is clearly understood.

Operationalizing a High Level of Flying Experience

Since a pilot's flying experience is considered a function of both total flight hours and their level of certification, the specific concept of what exactly constitutes a high level of flying experience should consider both of these factors. Army aviators, however, are not required to gain FAA certification. As a result, conceptualizing a high level of flying experience for Army aviators should, instead, involve a combination of total flight hours, pilot-in-command flight hours, and the award of a badge beyond the basic aviator level. For the purposes of this study, therefore, a high level of flying experience for Army aviators is defined as 1,500 total flight hours (e.g., the minimum number of hours required for the airline transport pilot certificate and the midpoint between the senior aviator and the master aviator designations within the Army) and 250 flight hours as a pilot-in-command (e.g., the minimum number of pilot-in-command hours required for certification as an airline transport pilot).

Career Development of Commissioned Army Aviators

Whether or not commissioned Army aviators will achieve a high level of flying experience, as defined above, is largely a function of their individual career pattern. Accordingly, some officers will serve in more operational flying assignments than others and, subsequently, may receive more opportunities to fly than others. Each commissioned Army aviator, however, is subject to the same career development program. As such, their experiences should be somewhat similar. Since the career development model, as articulated in Department of the Army Pamphlet 600-3: *Commissioned Officer*

Professional Development and Career Management has recently changed, it is important to review these documents with respect to flying guidance.

1998 Version of DA Pam 600-3

Providing a general framework for commissioned Army aviators, the 1998 version of the career development model offered that "the most unique feature about Aviation officers is the fact that they are all aviators and must develop technical proficiency in their aviator skills [and, therefore] it is in the Army's best interest to retain these officers in operational flying positions as long as possible to gain experience and competency in technical and tactical skills" (HQDA, 1998, p. 62). Further, commissioned Army aviators must "maintain individual crew currency and proficiency" (p. 65). Aside from these brief comments, however, the guidance offered no tangible guidance with respect to attaining certain levels of flight experience, earning designation as a pilot-in-command, or earning designation as a senior or master aviator. Instead, the guidance provided a listing of potential duty assignments and the timelines associated with serving in those assignments (See Figure 2.1).

2005 Version of DA Pam 600-3

Like the 1998 version, the revised guidance reiterated, "the most unique feature of Aviation officers is the fact that they are all aviators and must develop technical proficiency in their aviator skills" (HQDA, 2005, p. 113). Unlike the previous version, however, guidance with respect to gaining flying experience was much more specific (see Figure 2.2). Beginning with the characteristics expected of commissioned Army aviators, revised guidance suggested that, due to the environment in which aviators operate, they must be "intellectually agile leaders, who can see, comprehend, make accurate decisions and clearly communicate their intent while flying 120 knots toward the objective at tree top level" (p. 115). Interestingly, HQDA (2005) states that gaining this experience is not necessarily a function of the officer's professional military education or operational assignments. Instead, gaining expertise and competence falls under the realm of self-development and "every officer is responsible for his or her own self-development" (p. 115).

For example, lieutenants should be afforded the opportunity to achieve at least 500 flight hours and qualification as a pilot-in-command prior to being promoted to the rank of captain and serving as staff officers and company commanders. While serving as captains, they should continue to build flight experience, achieve/maintain pilot-in-command status, and strive to meet the requirements for the award of the senior aviator badge prior to being promoted to the rank of major. As majors, however, due to the typical non-operational generalist assignments in which they will serve, self-development "should be focused on refreshing themselves with new aviation technologies in the cockpit… [setting] the example for the younger generation of officers by continuing to place a strong emphasis on their technical and tactical aviation proficiency…[and striving] to attain the Master Aviator Badge by the time they are promoted to LTC" (p. 119).

Years of Service	0 – 5	5 – 10	10 – 15	15 – 20	20 – 25 – 30
	LT	**CPT**	**MAJ**	**LTC**	**COL**
	O B C	Captains Career Course ★ Functional Area Decision	★ Career Field Decision CSC	SSC	
Branch Qualifying	Initial Entry Rotary Wing Platoon Leader Section Leader (CMF 15G, CH-47)	Company Command Platoon Leader (Branch Qualifying for those positions authorized Captain Platoon Leaders when commanded by a Major/CMF 15G, CH-47)	One of the following: Battalion XO/S3* Brigade S3* Major level Company Command Battalion Support Operations Officer (15D) * *Serving in a similar position at a higher level satisfies this requirement.*	One of the following: Battalion Command Any Aviation coded LTC position CTC Brigade/Regiment/Group XO Division Primary Staff Corps Assistant G3/G4 Deputy Assistant G3 G3 Operations G3 Plans ROTC/Recruiting MACOM/ARSTAFF/ Joint Staff AC/RC	Field Grade Joint Duty Assignment One of the following: Brigade level Command CCAD Command (15D) Any Aviation coded COL position Corps G3/G4 TRADOC System Manager Division Chief of Staff USAAVNC Chief of Staff Corps Deputy Chief of Staff DAC, DOTDS, DCD, DES AMBL CTC Recruiting Brigade MACOM/ARSTAFF/ Joint Staff AC/RC
Develop-mental	Company XO Battalion LNO Battalion S1 Battalion S4 Assistant Battalion S3 Section Leader in AEB (15C) EH-60 Platoon Leader (15C)	Battalion Primary Staff Brigade/Regiment Staff Service School Instructor CTC Rotation RC Support MIOTC/MIOAC (15C) AEB Mission Operations Officer (15C) AEB Flight Operations Officer (15C) AEB Flight Platoon Leader (15C) UAV Company Commander (15C) Battalion S-2 (15C) CLOAC (15D) MM and MTP Course (15D) AVUM Command (15D) AVIM Platoon (15D) AVIM PC (15D) TRADOC Staff (15D) SOA Training (SOF) Platoon Leader (SOF) SOF Liaison Officer ROTC/USMA Faculty and Staff	Brigade/Regiment Primary Staff Div/Corps/MACOM Staff CTC Rotation RC Tng Spt Battalion XO/S3 RC Support Instructor at Branch Service School Inspector General OC/E at Maneuver Training Center SEMA Company Command (15C) AEB S3/XO (15C) Brigade S2 (15C) Chief, SEMAID, USAICS (15C) FA 35 (15C) AVIM Command (15D) FA 90 (15D) Company Command (SOF) SOA MACOM Staff (SOF) ROTC/USMA Faculty and Staff	Inspector General AEB Command (15C) Corps G2 Air (15C) GUARDRAIL Project Manager (15C) FA 35 (15C) AVIM (15D)	Inspector General FA 35 (15C) FA 90 (15D)

Figure 2.1, Commissioned Army Aviator Life Cycle Developmental Model. *Source:* Headquarters Department of the Army (1998). *Department of the Army pamphlet 600-3: Commissioned officer professional development and career management.* Washington, DC: Author. 73-74.

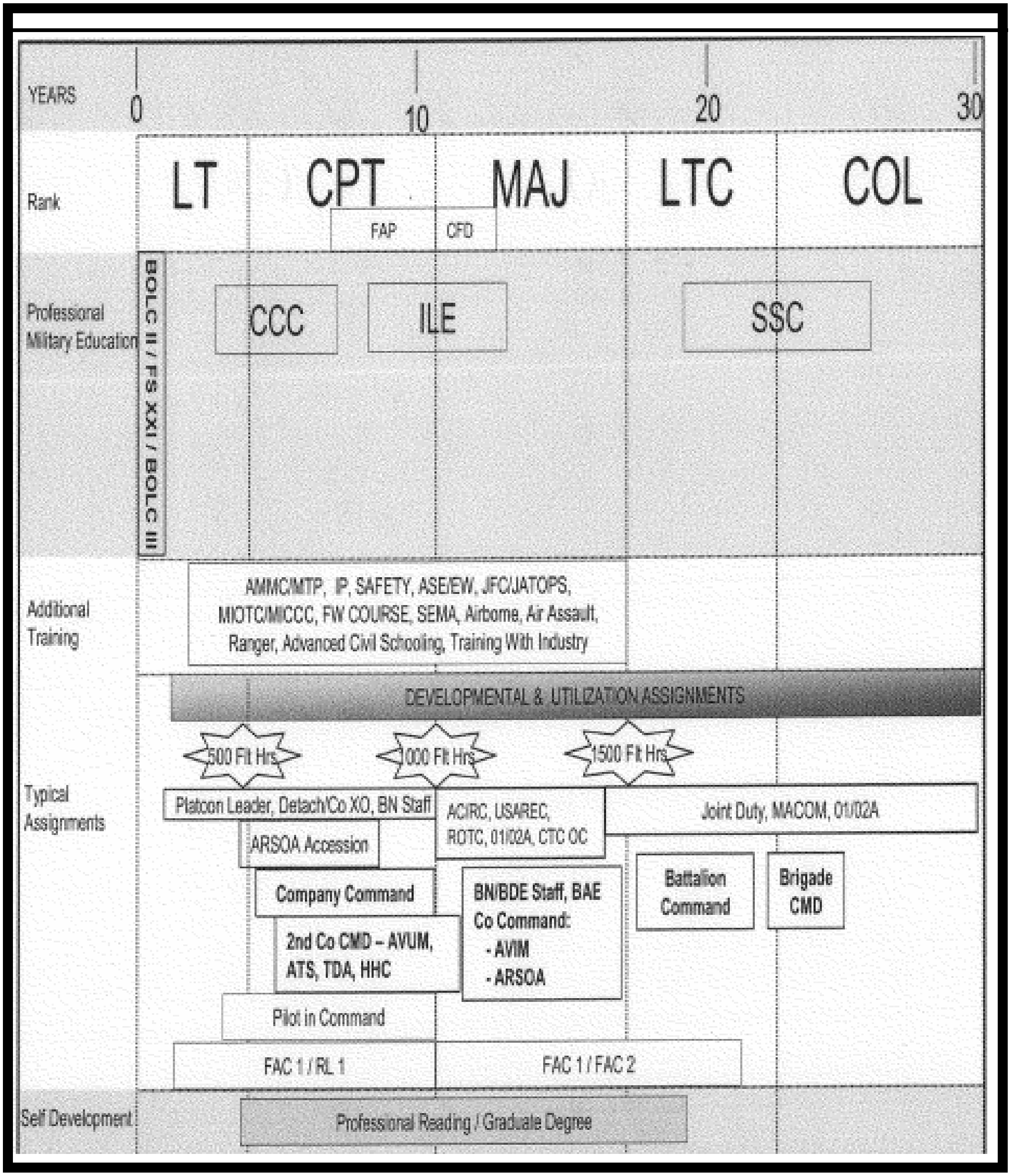

Figure 2.2, Commissioned Army Aviator Life Cycle Developmental Model.
Source: Headquarters Department of the Army. (2005). *Department of the Army pamphlet 600-3: Commissioned officer professional development and career management.* Washington, DC: Author. 116.

With these specific references to gaining and maintaining skill as a pilot, it is evident that the revised guidance emphasizes both aspects of flying experience as derived above, namely total flight hours and pilot-in-command flight hours. Although no specific guidance was offered in terms of the number of pilot-in-command hours that a commissioned officer should attain, it was quite clear that they should strive to attain at least 2,000 total flight hours over the course of a twenty-year career (e.g., earn the master aviator badge). In fact, this revised guidance stands in stark contrast to the developmental model, articulated only a few years earlier, that contained no references to PC status, no references to senior or master aviator badges, and no flying hour milestones to be achieved throughout a commissioned officer aviator's career (see HQDA, 1998).

Additional Guidance for Army Aviators

Shortly after the revision of the career development model for commissioned Army aviators, other specific guidance regarding aviators emerged. Specifically, *Training Circular 1-210: Aircrew Training Program Commander's Guide to Individual, Crew, and Collective Training,* the primary manual for all Army aviation training, reiterated the emphasis on gaining flying proficiency and pilot-in-command status for commissioned Army aviators (HQDA, 2006). Addressing aviators in general, the manual explained that they alone "have the ultimate responsibility in ensuring that they remain technically and tactically proficient….[and] they strive to become a PC at the earliest opportunity" (¶1-30). Addressing commissioned Army aviators in particular, the manual offered, "a fundamental step in the leader development process, for aviators, is achieving PC [status]" (¶1-38). Not surprisingly, aviators selected to command battalions "must maintain the highest level of proficiency in the aircraft and should be a PC" (¶1-17).

Aviators serving on battalion staff (e.g., battalion operations officer) "will maintain a high level of proficiency and should be a PC" (¶1-18). Finally, commissioned Army aviators serving as a company commander "will be highly proficient as an aviation leader and will be a PC" (¶1-19).

Self-Development

The explicit references to gaining and maintaining a high level of flying proficiency and experience, as well as striving to attain pilot-in-command status, emphasized that gaining this experience is an individual effort. As such, the individual aviator must engage in self-developmental activities to gain the requisite skill and experience in order to effectively lead aviation operations at all levels. Since gaining flying experience is considered a function of self-development, it is therefore important to operationalize the characteristics of people who successfully engage in this process.

As stated by Boyce and colleagues (2005), self-development is "an approach to training that relies on individuals to take the primary responsibility for identifying, planning, carrying out, and evaluating their own learning experience" (p. 1). This concept is extremely important in terms of a person's propensity to not only perfect skills, but also to maintain competence and continue to grow professionally (Bryant, 1994). Of course, not everyone will engage in self-development strategies in the same way. Instead, the propensity to engage in self-development programs is largely a function of stable dispositional attributes. Among these attributes, a person's motivation has emerged as significant (Cortina et. al, 2004).

Motivation

Since engaging in self-development is largely a function of motivation, and since self-development is the method through which commissioned officer aviators may attain the desired levels of flying experience and competence, it follows that an understanding of their motivation for gaining flying experience is valuable. The concept of motivation, however, is extremely robust and has been the focus of psychological inquiry for decades. In its most basic sense, motivation involves action. More precisely, motivation helps explain why people engage in certain behaviors and avoid others.

Intrinsic and Extrinsic Motivation

Within organizational settings, motivation involves the "influence of both environmental forces (e.g., organizational reward systems, the nature of work being performed) and forces inherent in the person (e.g., individual needs and motives) on work-related behavior" (Ambrose & Kulik, 1999, p. 231). Within the literature, studies involving motivation typically focus on either the reasons for engaging in a certain behavior or on a person's beliefs about their competence (Eccles & Wigfield, 2002). Interestingly, "even if people are certain they can do a task, they may have no compelling reason to do it" (p. 112). The reasons that do compel a person to engage in a task may be internal to the person, external to the person, or a combination of the two. Stated another way, intrinsic and extrinsic processes ultimately drive a person to act.

People who are intrinsically motivated typically engage in an activity because they enjoy it. Conversely, extrinsically motivated people will engage in an activity for other reasons, such as receiving some sort of tangible reward (Deci & Ryan, 1985). Similarly, Amabile and colleagues (1994) offered that intrinsically motivated people will seek opportunities to develop new skills, to gain a sense of competence, to master job-related tasks, to be challenged, and to enjoy their work. Extrinsically motivated people, on the other hand, will seek recognition, opportunities for promotion, competition, and prestige.

In analyzing Army aviators' motivational orientations, Marshburn and Rollin (2005) found that commissioned officer aviators exhibited a dual motivational orientation (e.g., motivated both through intrinsic and extrinsic processes) in terms of their work-related reinforcement preferences. As such, they would likely "seek opportunities for competence, challenge, and enjoyment while focusing on income goals, promotion goals, and the potential for recognition for their efforts" (p. 80). Additionally, commissioned officer aviators displayed strong preferences for gaining flight experience, but expected to fly much less than they would prefer. Despite intrinsic motivation significantly improving the prediction of preferences for gaining flight experience, it remained unclear as to the factors that truly motivated these aviators to gain this flying experience (Marshburn & Rollin, 2005).

Expectancy Theory of Motivation

To quantify the factors that motivate commissioned Army aviators to gain a high level of flying experience, the expectancy theory of motivation may prove useful. In fact, it is "particularly applicable to understanding future behaviors" (Boyce et. al, 2005). Expectancy theory (Vroom, 1964) proposes that workers will work in ways geared toward the achievement of those outcomes they deem important, achievable, and within their grasp.

According to Vroom (1964), the relative motivation to achieve those outcomes is based on three constructs: expectancy, instrumentality, and valence. First, expectancy involves whether or not the worker believes a particular outcome is possible (e.g., a commissioned Army aviator's belief that he or she can actually gain a high level of flying experience). Second, instrumentality involves whether or not a worker believes that by achieving one outcome, another outcome will be received (e.g., a commissioned Army aviator's belief that by gaining a high level of flying experience, they will selected for command at the battalion or brigade level). Third, valence involves the worker's assessment of the relative importance or preference for an award (e.g., a commissioned Army aviator values being selected to command at the battalion or brigade level). Simply, when workers expect that if, by engaging in a behavior that will achieve a certain outcome, another attractive outcome will result, then they will likely be more motivated to engage in the behavior. Stated another way, workers will exert more effort in those job-related tasks that will result in the rewards they desire.

As expectancy theory was initially conceptualized, a person's motivation to engage in a behavior was the multiplicative product of the person's ratings of expectancy, valence, and instrumentality (Vroom, 1964). Recently, Van Eerde and Thierry (1996) found that the multiplicative models did not yield more information than simply analyzing the individual components separately. Perhaps more salient, Saks and colleagues (1994) found that the product of instrumentality and valence significantly predicted behavioral choice in the occupational realm. Each of these analyses, however, considered only the effects of external rewards.

Finding the reliance on external rewards somewhat flawed, Tien (2000) offered that "the motivating effects of other incentives, both intrinsic and extrinsic, need to be considered" (p. 727). As such, Tien analyzed the various factors that motivated college faculty to perform research (in terms of instrumentality and valence, alone) through the inclusion of both intrinsic and extrinsic rewards. In doing so, she found that "when individuals consider a particular reward is important, and when the…measure may provide them with the opportunities to obtain the particular reward, they will probably perform that type of…activity" (p. 744).

With this in mind, the factors that motivate commissioned officer aviators to gain high levels of flying experience are quantifiable. Based on the career development model for commissioned Army aviators, it seems as if aviators may be motivated through extrinsic incentives (e.g., motivated to gain a high level of flying experience to remain competitive for selection for battalion and brigade level commands or to be awarded senior or master aviator wings). Based on Marshburn and Rollin (2005), however, they may also be motivated to gain this experience for intrinsic reasons (e.g., feelings of competence or enjoyment).

Hypothesis

The primary research question being analyzed through this study revolves around determining the factors that motivate commissioned Army aviators to gain high levels of flying experience. Based on the concept of self-development and its linkage to motivation theory, especially intrinsic and extrinsic motivational orientation, this question can be refined. Specifically, are commissioned Army aviators motivated to gain high levels of flying experience due to intrinsic or extrinsic reasons? Despite exhibiting dual motivational orientations with respect to work-related reinforcement preferences in general, it appears that they may exhibit a stronger intrinsic motivational orientation with respect to flying (see Marshburn & Rollin, 2005). As such, it is hypothesized that commissioned Army aviators will be more motivated to gain high levels of flying experience by intrinsic reasons (e.g., mastery, challenge, enjoyment, and challenge) than by extrinsic reasons (e.g., recognition, promotion, selection for command, or award of the master aviator badge).

Statistically, this hypothesis will be examined in the alternate form, indicating that there is a statistically significant difference between intrinsic factors and extrinsic factors and their motivating effect on commissioned Army aviators with respect to gaining high levels of flying experience. As such, this hypothesis is expressed below.

Hypothesis: *Commissioned Army aviators are more intrinsically motivated than extrinsically motivated to gain high levels of flying experience.*

H_a: $\mu_{intrinsic} > \mu_{extrinsic}$, where μ equals the mean motivational force based on the product of instrumentality and valence for each factor.

CHAPTER 3

METHOD

The previous chapter described the importance the Army places on commissioned Army aviators' flying experience, particularly with respect to attaining specified levels of total flight hours and to earning the designation as pilot-in-command. Since gaining this flying experience is considered a function of an aviator's self-development, the review of the literature demonstrated that motivation, particularly intrinsic motivation, is a trait-like characteristic often associated with a person's likelihood of successfully engaging in self-developmental programs. Therefore, using motivation as the theoretical foundation, this research was conducted to determine the factors that most motivate commissioned Army aviators to gain flying experience. Specifically, this research sought to evaluate whether commissioned Army aviators were more intrinsically or extrinsically motivated to fly and, if so, whether intrinsic motivation was linked to actual flying experience.

With these issues in mind, this chapter will illustrate the way in which the researcher conducted this study in order to answer the primary research question. In doing so, this chapter will describe the participants of this study as they relate to the overall population of commissioned Army aviators. Additionally, this chapter will provide information about the measures used to collect data from the participants, including the variables of interest and the actual survey instrument. Finally, this chapter will discuss the procedures used to recruit participants, to collect data, and to statistically analyze the data.

Participants

Since this study sought to evaluate the factors that motivate commissioned Army aviators to gain flying experience, it is necessary to first understand the population of commissioned Army aviators prior to introducing the pool of available participants that comprised the sample.

Overview of Population

Although somewhat dynamic due to officer accession, retention, and attrition, the population of commissioned Army aviators is relatively constant. In fact, the aviation branch assignments officers serving within the United States Army Human Resources Command (HRC) manage all of the commissioned Army aviators in the ranks of lieutenant through lieutenant colonel. Through this management, the overall density of commissioned officer aviators by rank and by primary aircraft specialty is known. Figures 3.1 and 3.2 below provide a pictorial representation of the distribution of commissioned Army aviators by rank and by aircraft specialty, respectively.

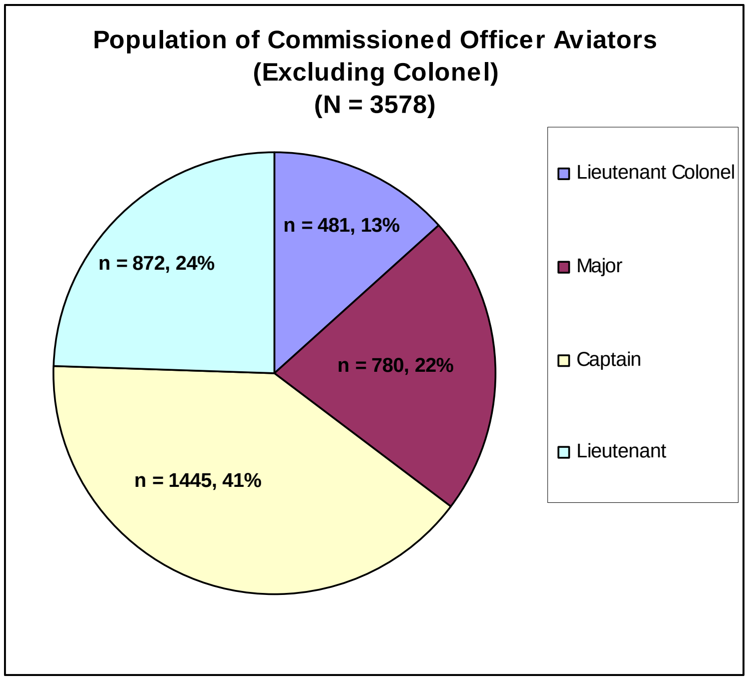

Figure 3.1, Population of Commissioned Officer Aviators
*Source: Population Data Adapted from Human Resources Command (2007).

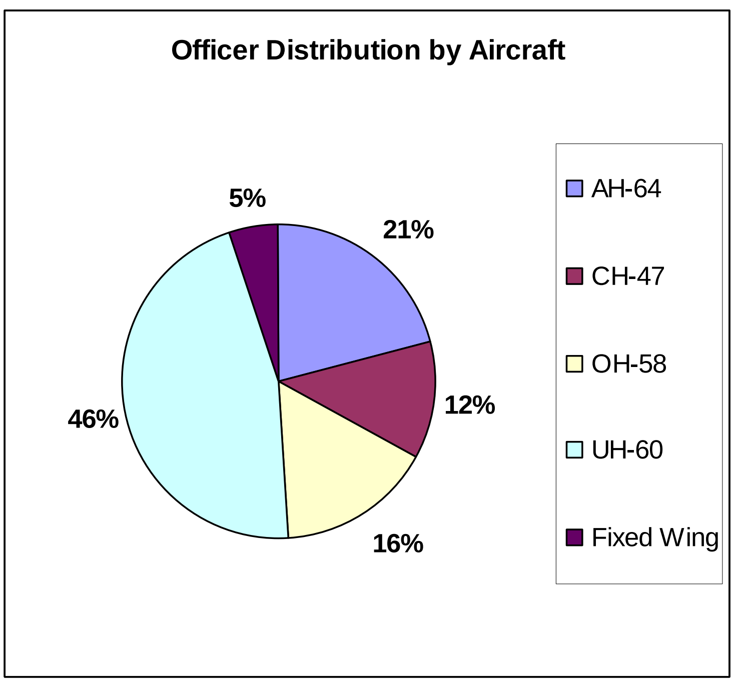

Figure 3.2, Officer Distribution by Aircraft Specialty
*Source: Data Adapted from Aviation Assignments Branch (2005).

Population of Interest

As is typical with research, obtaining data from an entire population is often impractical or logistically prohibitive. The same holds true for this study. With more than 3,500 commissioned Army aviators serving in operational and non-operational assignments throughout the world, gaining access to this population in its entirety posed difficulty. Based on this difficulty, and due to time constraints associated with this study, the researcher elected to streamline the population of interest to commissioned Army aviators serving in the rank of major.

All Army majors serving in the operational career field, including those serving in the Aviation branch, will attend the Command and General Staff Officer Course (CGSOC) or the equivalent military education courses offered through the United States Navy, the United States Air Force, or through foreign military programs (Aviation Assignments Branch, 2005). The Command and General Staff Officer Course is conducted at Fort Leavenworth, Kansas and during the period of this study, 85 commissioned Army aviators were enrolled in this course (more than 10% of the entire population of Aviation branch majors). Since these aviators were enrolled in this course through assignment instructions generated by their career managers, and because the career managers manage the entire population of aviators, it was reasonable to believe that the aviators participating in this course would be fairly representative of the total population of aviation majors. Subsequently, the pool of potential participants for this study included only those aviators attending the course of instruction at Fort Leavenworth.

Measures

To test the hypothesis that commissioned Army aviators are more intrinsically motivated than extrinsically motivated to gain flying experience, the researcher needed to ensure that there was a practical and efficient way of measuring this phenomenon. Since no previous research existed that sought to measure the factors that motivate aviators to fly, the researcher created an instrument to do just that. This instrument consisted of both demographic questions and expectancy-based motivation questions (see Appendix C). Specific content associated with this instrument is discussed below.

Demographic Information

The researcher designed the demographic portion of the survey instrument to provide a general description of the sample. This portion required that participants indicate the following: gender (male = 0, female = 1); age (in years); total active federal service (in years); total operational flying duty credit (in months); primary aircraft type (e.g., AH64 = 0, CH47 = 1, OH58 = 2, UH60 = 3, Fixed Wing = 4); total flight time in Army aircraft (in hours); total Army pilot-in-command time (in hours); an indication of the participant's conceptualization of the amount of flight time that equates to a high level of flying experience (in hours); and an indication of the participant's expectation of the highest operational aviation position in which they would serve (e.g., primary battalion staff = 1; primary brigade staff = 2; battalion commander = 3; brigade commander = 4; General Officer = 5). Of this demographic information, the participant's total Army flight time (in hours) and total Army pilot-in-command time (in hours) served as the primary variables associated with flying experience.

Motivation Information

Based on the literature associated with intrinsic and extrinsic motivation (see Amabile, 1994; Deci & Ryan, 1985), the motivation variables used in this study were similar, and identical in some cases, to those characteristics. The characteristics of intrinsic motivation and the intrinsic variables measured through this study are shown in Table 3.1 below. Likewise, the characteristics of extrinsic motivation and the extrinsic variables measures through this study are shown in Table 3.2 below.

Table 3.1, Intrinsic Motivation Variables

THEORETICAL CONSTRUCTS	VARIABLES USED IN STUDY
Person engages in the activity in order to gain a sense a sense of competence	Sense of Competence
Person engages in the activity in order to master the skills associated with the activity	Mastery of a skill
Person engages in the activity because it is enjoyable to them	Enjoyment
Person engages in the activity because it provides opportunity to deal with challenging situations	Ability to deal with challenge
Person engages in the activity in order to develop new skills	No variable associated with this theoretical construct since only one task (flying) was evaluated in this study.

Table 3.2, Extrinsic Motivation Variables

THEORETICAL CONSTRUCTS	VARIABLES USED IN STUDY
Person engages in the activity based on a tangible reward that will be earned	Earning the Master Aviator Badge
Person engages in the activity because it will lead to recognition from others	Recognition from Others
Person engages in the activity because it will lead to promotion	Promotion
Person engages in the activity because it allows them to be in competition with others	Selection for Command
Person engages in the activity because it provides prestige	No variable associated with this theoretical construct.

Using the four intrinsic and four extrinsic motivational variables, participants indicated on a nine-point scale (e.g., 1 = complete disagreement; 5 = neutral; 9 = complete agreement) their subjective ratings of agreement about 16 questions. The first eight questions addressed the participant's assessment of the instrumentality of gaining a high level of flying of flying experience on obtaining the four intrinsic factors (e.g., mastery of a skill, ability to deal with challenge; sense of competence, and enjoyment) and the four extrinsic factors (e.g., recognition from others, selection for command, the master aviator badge, and promotion). For instrumentality ratings, participants provided their individual rating to the question "To me, gaining a high level of flying experience is influential in obtaining…" The second eight questions addressed the participant's assessment of valence associated with obtaining each of those factors. For valence ratings, participants provided their individual rating to the question, "Gaining the following is important to me."

Similar to Tien's (2000) conceptualization of motivation, the researcher then calculated each participant's overall motivation to gain a high level of flying experience based on each of the eight factors. The formula used was as follows:

$M_{\text{FEfactor}} = V_{\text{factor}} * I_{\text{factor}}$ where M = the motivation to gain a high level of flying experience based on the individual factor, V_{factor} = the valence of the individual factor, and I_{factor} = the instrumentality of gaining a high level of flying experience on obtaining the individual factor.

Through this process, each participant received eight individual scores for motivation. Since four scores were based on intrinsic motivation and four were based on extrinsic motivation, the researcher calculated the mean of the intrinsic factors and the mean of the extrinsic factors to yield two distinct motivation scores (e.g., motivation to gain flying experience based on intrinsic reasons and the motivation to gain flying experience based on extrinsic factors).

To ensure that the factors associated with each scale measured the construct as envisioned (e.g., either intrinsic motivation or extrinsic motivation), the researcher conducted an assessment of internal consistency. Internal consistency assessments provide a test's reliability by estimating how well the items of the test measure a construct based on the correlation among the items associated with the construct (Cohen & Swerdlik, 2002). Cronbach's alpha, the average of these correlations, is "the most widely used measure of reliability" (Aron & Aron, 1999, p. 271) and can range from 0 to 1, with higher values indicating more internal consistency. According to Aron and Aron, "in the social and behavioral sciences, a measure should have a reliability of at least .7 and preferably closer to .9 to be considered useful" (p. 271). For this study, internal consistency of the intrinsic scale items was satisfactory (Cronbach's $\alpha = .8304$). Likewise, internal consistency of the extrinsic scale items was satisfactory (Cronbach's $\alpha = .7039$).

Procedures

Pilot Study

Prior to conducting this research, the researcher initiated a small pilot study in order to determine the adequacy of the survey instrument and the ease of participation. Specifically, 24 commissioned Army aviators serving on the Staff and Faculty of the United States Military Academy at West Point, New York completed the survey instrument and provided their feedback. Overall, the participants indicated that the instructions and the informed consent information were clear, concise, and understandable. The requirements of the survey, on the other hand, did lead to some confusion.

The original survey instrument contained a demographic portion and a motivation portion. To assess each participant's instrumentality and valence, however, the participants were required to rate their subjective feelings of importance, instead of agreement. Participants rated their feelings of importance for each of the factors on a nine-point scale (e.g., 1 = 0%, 2 = 12.5%, 3 = 25%, 4 = 37.5%, 5 = 50%, 6 = 62.5%, 7 = 75%, 8 = 87.5%, and 9 = 100%). The use of percentages caused some confusion; some of the participants contacted the researcher for further elaboration. As a result, the researcher revised the scaling of the instrument to include a Likert scale utilizing subjective feelings of agreement.

Although there were some questions about the scaling of the motivation responses, the instrument did appear to measure the constructs of intrinsic motivation and extrinsic motivation as envisioned. Specifically, the internal consistency of the intrinsic scale items was satisfactory (Cronbach's $\alpha = .8196$) and the internal consistency of the extrinsic scale items was marginal (Cronbach's $\alpha = .6320$). Upon inspection, however, the extrinsic factor of "recognition from peers, superiors, and subordinates" undermined the reliability of the scale. In fact, without this variable, the internal consistency for the extrinsic scale items was satisfactory (Cronbach's $\alpha = .7018$). Since recognition is generally regarded as an extrinsic process (see Amabile, 1994), this variable was revised to read as "recognition from others" in order to avoid potential issues of assessing three distinct processes.

Minimum Sample Size

The researcher formally calculated the minimum sample size required prior to initiating this study. Based on typical values used in psychological research, the risk of Type I error (probability of rejecting the null hypothesis when true) was set at .05 ($\alpha = .05$). Likewise, the risk of Type II error (probability of failing to reject the null hypothesis when false) was set at .10 ($\beta = .10$). Additionally, since previous research suggests that Army aviators are dually motivated (see Marshburn and Rollin, 2005), the researcher determined that an effect size of one-half standard deviation between intrinsic motivation and extrinsic motivation constituted an important difference. Therefore, with $\alpha = .05$, $\beta = .10$, and an effect size of 1/2 standard deviation, the minimum adequate sample size for this study required at least 35 participants.

Participant Recruiting and Data Collection

As previously mentioned, the entire population of commissioned officer aviators, both male and female, attending the Command and General Staff Officer Course at Fort Leavenworth, Kansas was eligible for participation in this study. The Quality Assurance Office of the Command and General Staff College, Fort Leavenworth, Kansas provided final approval (see Appendix A) for this study on November 7, 2006. Prior to participation, each participant received formal instructions and provided their informed consent (see Appendix B).

To recruit participants, all 85 commissioned Army aviators enrolled in the Command and General Staff College during fall semester of the 2006 - 2007 academic year received an electronic mail request for participation. This request provided instructions, informed consent information, and the survey instrument (as an attachment). Participants completed the survey instrument on their own and returned it to the researcher as an electronic mail "reply" message. The participants received no incentives for participation. Once received, the researcher printed the message, coded the completed surveys to ensure confidentiality, created the data file, and deleted the messages from the electronic mail "inbox." The potential participants received no pressure to volunteer; however, after the initial request for participation, the researcher sent a follow-up request one week later. The participation period began on December 1, 2006 and ended two weeks later.

Research Design / Statistical Analysis

Research Design

This study focused on evaluating the factors that motivate commissioned officer aviators to gain high levels of flying experience. As such, the study involved survey-based research using a sample of convenience and included hypothesis testing in order to determine whether or not commissioned Army aviators were motivated to gain high levels of flying experience due to intrinsic or extrinsic reasons.

Statistical Analyses

The researcher conducted statistical analyses in three stages using the Statistical Package for the Social Science software (version 10). First, prior to hypothesis testing, the researcher conducted descriptive data analysis in order to describe the sample. Second, after descriptive data were generated, the researcher conducted the paired sample t-test procedure in order to test the hypothesis that commissioned Army aviators are more intrinsically motivated to gain high levels of flying experience than extrinsically motivated. Third, the researcher conducted multiple linear regression analyses to evaluate how well motivation and demographic variables predicted each variable associated with flying experience, namely total flight hours and total pilot-in-command flight hours.

Paired Samples T-test procedure. Using difference scores between two variables for each participant (e.g., intrinsic motivation and extrinsic motivation), the paired samples T-test procedure evaluates whether or not the difference between the means of both variables is significantly different from zero (Green et. al, 2000). For this study, since all of the motivation scores for both intrinsic and extrinsic factors were calculated using the same scale, this comparison was fairly straightforward. Prior to conducting the analysis, however, the researcher calculated the mean level of intrinsic and extrinsic motivation for each participant. For example, the participant's intrinsic motivational force was derived from the arithmetic mean of the sum of the intrinsic factors (e.g., motivational force values for competence, skill, enjoyment, and challenge). Likewise, the participant's extrinsic motivational force was derived from the arithmetic mean of the sum of the extrinsic factors (e.g., motivational force values for master aviator badge, promotion, command selection, and recognition from others).

<u>Multiple regression analysis.</u> Two separate multiple regression analyses were conducted in order to evaluate how well motivation, in conjunction with demographic variables, predicted each of the flying experience variables (e.g., total flight hours and hours logged as pilot-in-command). An extension of bivariate regression that is used to predict the score of one variable based on another, multiple regression is a statistical procedure useful in predicting a score of one variable on the basis of several others. In fact, multiple regression "is eminently suited for analyzing collective and separate effects of two or more independent [predictor] variables on a dependent [criterion] variable" (Pedhazur, 1997, p. 3). Additionally, it allows the researcher "…to determine more accurately the direction and strength of their effects, to rule out spurious effects, to better understand, predict, and explain a dependent [criterion] variable, and to control the probability of Type I error" (Orme & Buehler, 2001, p. 49). It is, however, a complex statistical procedure that requires the researcher to consider both the way in which variables are entered into the regression model and the actual sample size (see Green, Salkind, & Akey, 2000; Pedhazur, 1997).

Since no previous research sought to either explain or predict an aviator's flying experience, the researcher had no theoretical rationale to assume that the predictors had causal relationships or could be divided into sets. More importantly, the sample size, although considered adequate for various statistical analyses, was relatively small. Based on these considerations, the researcher used the simultaneous entry technique for multiple regression analysis. According to Pedhazur (1997), the simultaneous entry method is particularly useful when no theoretical expectation about the causality of variables is considered and when the sample size is not large (e.g., around 15 participants per predictor variable). This technique is considered the most basic method of multiple regression, where all of the predictor variables are entered simultaneously in order "to make the most accurate prediction of possible scores on the criterion variable" (Hoyt, Leierer, & Millington, 2006, p. 224).

Data were collected on motivation variables as well as demographic variables. Subsequently, there were many variables that could be included in the analyses. Only four variables, however, were used in the analyses. These variables included intrinsic motivation, total months of operational flying duty, total hours logged as pilot-in-command, and total flight hours. Variables relating to gender and to type aircraft flown were omitted from consideration due to the relatively small number of responses in the categories (e.g., only one female and only one fixed-wing pilot). Likewise, variables relating to age and total active federal service were omitted from consideration since these variables were not expected to have any influence on flying experience (e.g., months spent accruing operational flying duty serve as the only time periods where aviators may serve as pilots and accrue flying experience, regardless of age and total active federal service).

CHAPTER 4

RESULTS

The purpose of this study was to evaluate whether commissioned Army aviators were more intrinsically motivated than extrinsically motivated to gain high levels of flying experience. Additionally, the research sought to evaluate whether any of the variables were significant in predicting the variables associated with flying experience, namely total flight hours and total pilot-in-command hours. To discuss the results, this chapter is divided into four primary sections including preliminary data analysis, primary statistical analysis for hypothesis testing, additional analysis, and a brief summary of findings.

Preliminary Data Analysis

Prior to hypothesis testing, each participant's survey responses was verified for completeness and scored. Of the 85 commissioned officer aviators eligible for participation, 45 of them completed surveys within the two-week period of data collection (return rate of 53%). Based on the calculated minimum sample size (n=35, calculated from $\alpha = .05$, $\beta = .10$, and effect size = ½ σ), this number of responses was sufficient. As such, preliminary data analysis consisted of identifying potential outliers and deriving descriptive statistics for the following variables: flying experience; conceptualization of a high level of flying experience; opportunities to fly, both past experiences and future expectations; highest level of operational aviation assignment expected; and motivation variables. Each of these is discussed below.

Outliers

In order to conduct hypothesis testing and other delicate statistical procedures that this study required, the researcher first examined the data to determine whether there were any potential outliers. Outliers, those data points falling well outside the norm for a particular variable, are often the result of sampling error, misreporting, data errors, or simply a legitimate score occurring by chance in a sample (Osborne & Overbay, 2004). No matter their cause, outliers in datasets can lead to substantial distortions in estimation and can have negative effects when conducting statistical tests. As such, the researcher considered any value that was three standard deviations above or below the mean (see Osborne & Overbay, 2004) of a particular variable as the threshold for determining whether a data point was, in fact, an outlier.

To determine if there were any outliers that could potentially influence the results, the researcher converted the scores for total flight hours and pilot-in-command hours to standard unit scores (z-scores) and evaluated whether any of the participants' scores were greater than three standard deviations from the mean. One participant's score for total flight hours (3720 total) was 3.4 standard deviations from the mean. Subsequently, this participant's packet was removed from the data set. As a result, the final sample retained for primary statistical analysis contained 44 participants.

Final Sample Demographics

The sample of participants for this study consisted of 43 male and 1 female participants. The mean age was 36.7 years (SD = 3.19, range = 32 - 44). The mean active federal service time was 13.9 years (SD = 3.02, range = 10 - 24). The mean total operational flying duty credit was 126.25 months (*SD* = 27.74, range = 81 - 198). Of the participants, 12 flew AH-64 aircraft (27%), 4 flew CH-47 aircraft (9%), 5 flew OH-58 aircraft (11%), 21 flew UH-60 aircraft (48%), 1 flew fixed-wing aircraft (2%), and 1 flew another type aircraft not otherwise specified (2%).

<u>Flying Experience</u>

For this study, an aviator's total flight hours and total flight hours logged as a pilot-in-command served as the primary variables associated with flying experience. As originally stated, a high level of flying experience was conceptualized to equate to a total of at least 1500 flight hours with 250 hours as pilot-in-command. Of the participants, 11 aviators had flown at least 1500 hours (25%) and 19 aviators had logged at least 250 hours as pilot-in-command (43%). Only 10 participants, however, had logged both at least 1500 total flight hours and at least 250 pilot-in-command hours (23%). The mean for total flight hours was 1252.23 (*SD* = 611.66, median = 1100, mode = 1200, range = 350 - 3100) and the mean for pilot-in-command flight hours was 327.16 (*SD* = 438.82, median = 176, mode = 0, range = 0 - 1750). Histograms for both total flight hours and total pilot-in-command hours are shown in Figures 4.1 and 4.2, respectively.

In addition to gathering the aviators' actual flying experience, the questionnaire required each participant to provide a subjective assessment of the number of total flight hours they believed equate to a high level of flying experience. Of the participants, 20 aviators indicated that a high level of flying experience equaled at least 1500 hours (45%). The responses to this question yielded a mean of 1416.74 hours (*SD* = 773.97, median = 1000, mode = 1000, range = 500 - 4320).

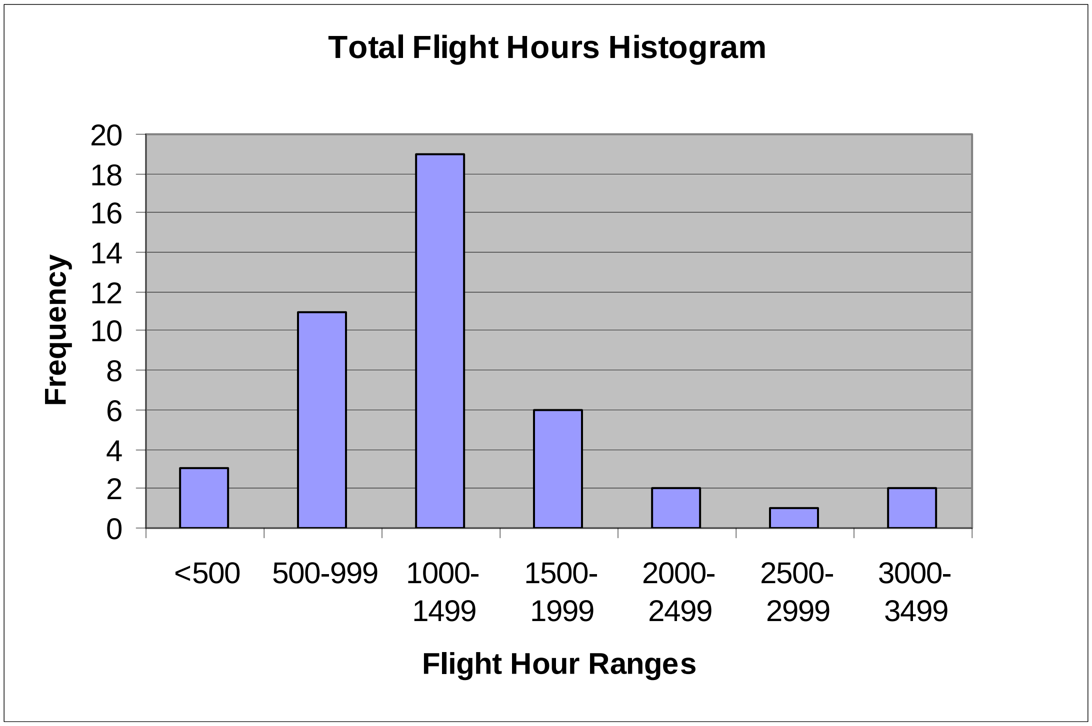

Figure 4.1, Total Flight Hours Histogram

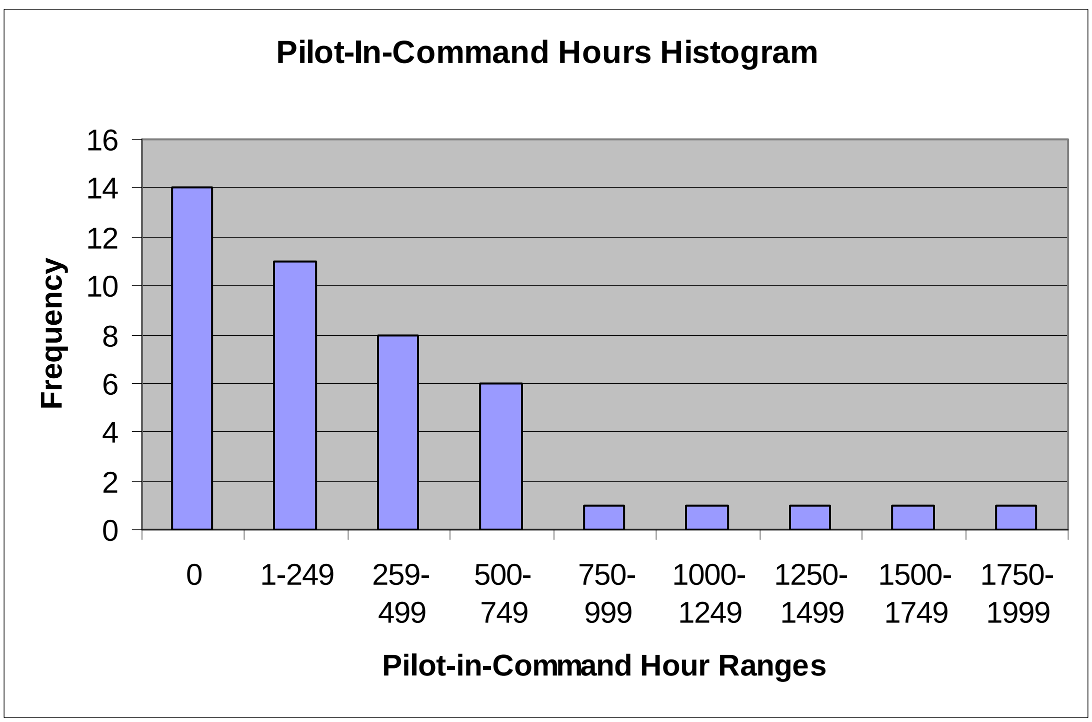

Figure 4.2, Pilot-in-Command Hours Histogram

Subjective Ratings of Sufficiency of Opportunities to Fly

In order to describe the participants' assessment of opportunities to gain flying experience within the Army, the researcher posed two questions. The first question required the aviators to reflect on their past and rate their level of agreement with the statement, “So far in my Army career, I have had sufficient opportunities to fly.” The second question required the aviators to think about their future and rate their level of agreement with the statement, “In future assignments, I expect to have sufficient opportunities to fly.” Both questions were rated on a nine-point Likert scale, with a response of 1 indicating complete disagreement, 5 indicating neutral agreement, and 9 indicating complete agreement.

Responses to the sufficiency of past opportunities to fly question generally indicated neutral feelings (M = 4.95, SD = 2.54, median = 5, mode = 5). Responses to the expectation of future opportunities to fly, however, generally indicated slight disagreement (M = 4, SD = 2.35, median = 4, mode = 1). Histograms for each of these questions are presented in Figures 4.3 and 4.4 below.

Figure 4.3, Histogram of Sufficiency of Past Opportunities to Fly

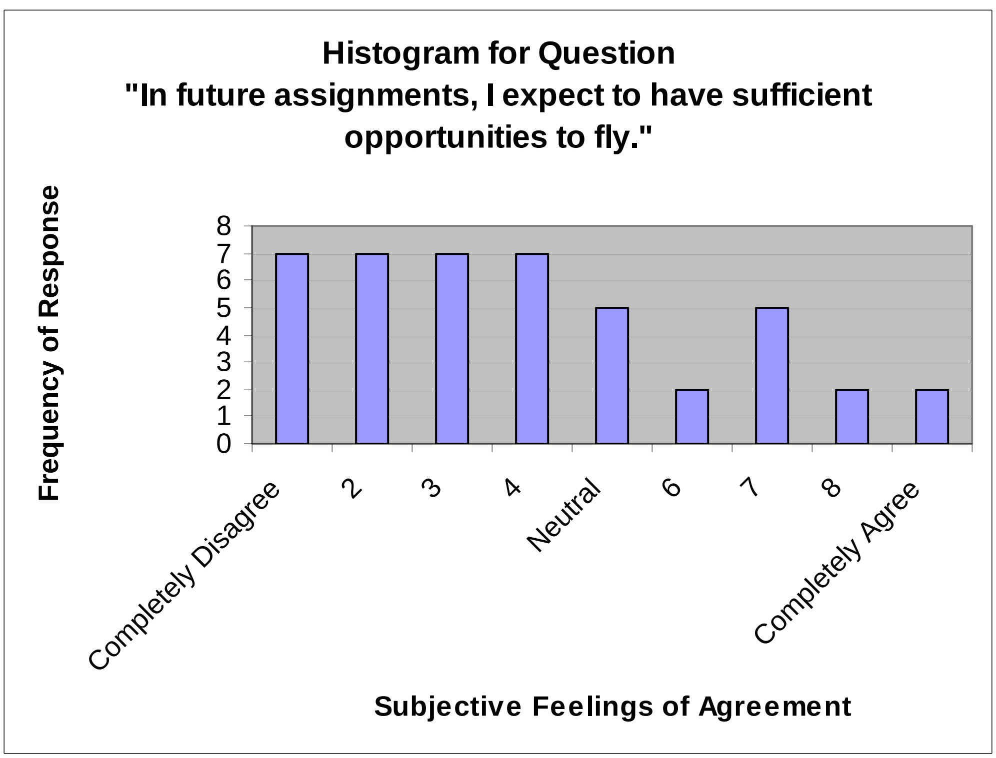

Figure 4.4, Histogram of Expectations for Sufficiency of Future Opportunities to Fly

Future Operational Aviation Positions

Participants were asked to indicate the highest level of operational aviation position in which they expected to serve. Potential responses ranged from serving as a primary battalion staff officer, as a primary brigade staff officer, as a battalion commander, as a brigade commander, or as a general officer. Only 10 officers indicated that they did not expect to serve as at least a battalion commander (23%), while the remaining 34 officers (77%) expected to serve as at least a battalion commander. A histogram showing the frequency of responses for this question is shown in Figure 4.5 below.

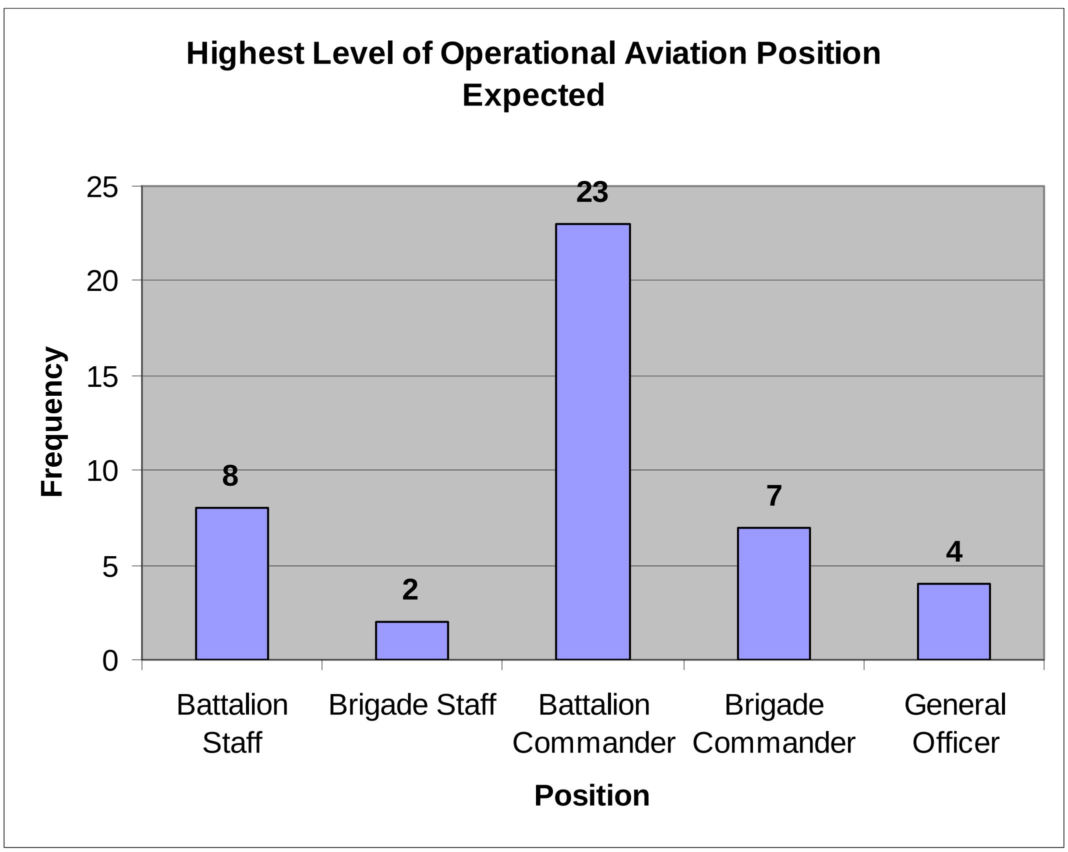

Figure 4.5, Histogram of Highest Level of Operational Aviation Position Expected

Motivation Variables

To quantify the factors that motivate aviators to gain a high level of flying experience, the survey instrument required the participants to rate their levels of agreement with respect to each of the eight motivational factors. Four of the factors (e.g., competence, skill, enjoyment, and challenge) involved intrinsic motivation while the remaining four factors (e.g., promotion, recognition from others, selection for command, and the master aviator badge) involved extrinsic motivation. Both the instrumentality (e.g., the relative influence that gaining flying experience had on gaining the factor) and the valence (e.g., the relative importance that the aviator placed on actually gaining the factor) were rated for each factor. Levels of agreement were rated on a nine-point scale (1 = complete disagreement, 5 = neutral, and 9 = complete agreement).

Instrumentality and Valence of Individual Motivational Factors. In terms of instrumentality, participants indicated that gaining a high level of flying experience would have the most influence on gaining a skill and a sense of competence. Conversely, participants indicated that gaining a high level of flying experience would have relatively little influence on being promoted or being selected for command. In terms of valence, participants felt that gaining a sense of competence and a skill were the most important factors to them. Conversely, participants indicated that gaining the master aviator badge and recognition from others were least important to them. Mean values of instrumentality and valence ratings for each of the motivational factors are shown in Figures 4.6 and 4.7, respectively.

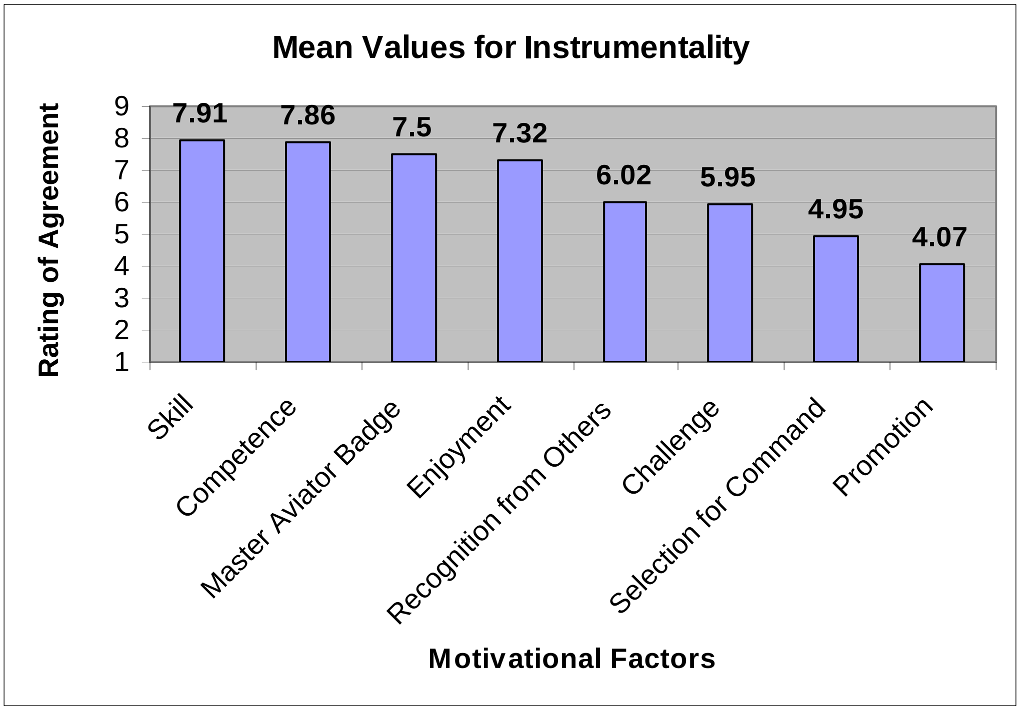

Figure 4.6, Mean Values for Instrumentality Ratings

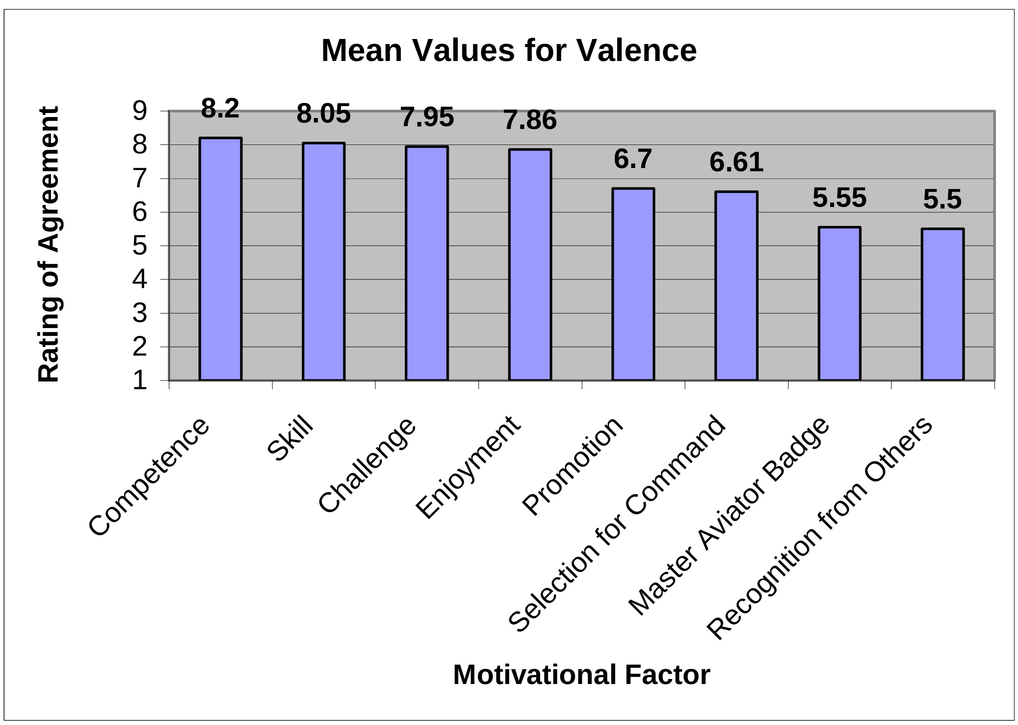

Figure 4.7, Mean Values for Valence Ratings

Motivational Force of Individual Motivational Factors. Through these ratings, the researcher calculated the motivational force for each of the factors by multiplying the ratings for instrumentality and valence for each factor. A participant's motivational force for each factor could range from a total of 1 (minimum motivational force) to 81 (maximum motivational force). For example, if an aviator completely agreed that gaining a high level of flying experience was instrumental in receiving the master aviator badge (instrumentality rating of 9) but completely disagreed that the obtaining the master aviator badge was important to them (valence rating of 1), the motivational force would equal 9. If, however, the aviator exhibited neutral agreement for both instrumentality and valence, then the motivational force equaled 25.

The results for the sample indicated that the participants seemed to be motivated more by the intrinsic factors than by the extrinsic factors. Specifically, the mean and standard deviation for the intrinsic factors were: competence (M = 65.95, SD = 17.09); skill (M = 65.20, SD = 17.57); enjoyment (M = 58.95, SD = 20.91); and challenge (M = 49.18, SD = 22.75). The mean and standard deviation for the extrinsic factors were: master aviator badge (M = 43.18, SD = 22.37); command selection (M = 34.55, SD = 20.79); recognition from others (M = 34.32, SD = 19.37) and promotion (M = 28.45, SD = 19.89). A graphical representation of these results is shown in Figure 4.8.

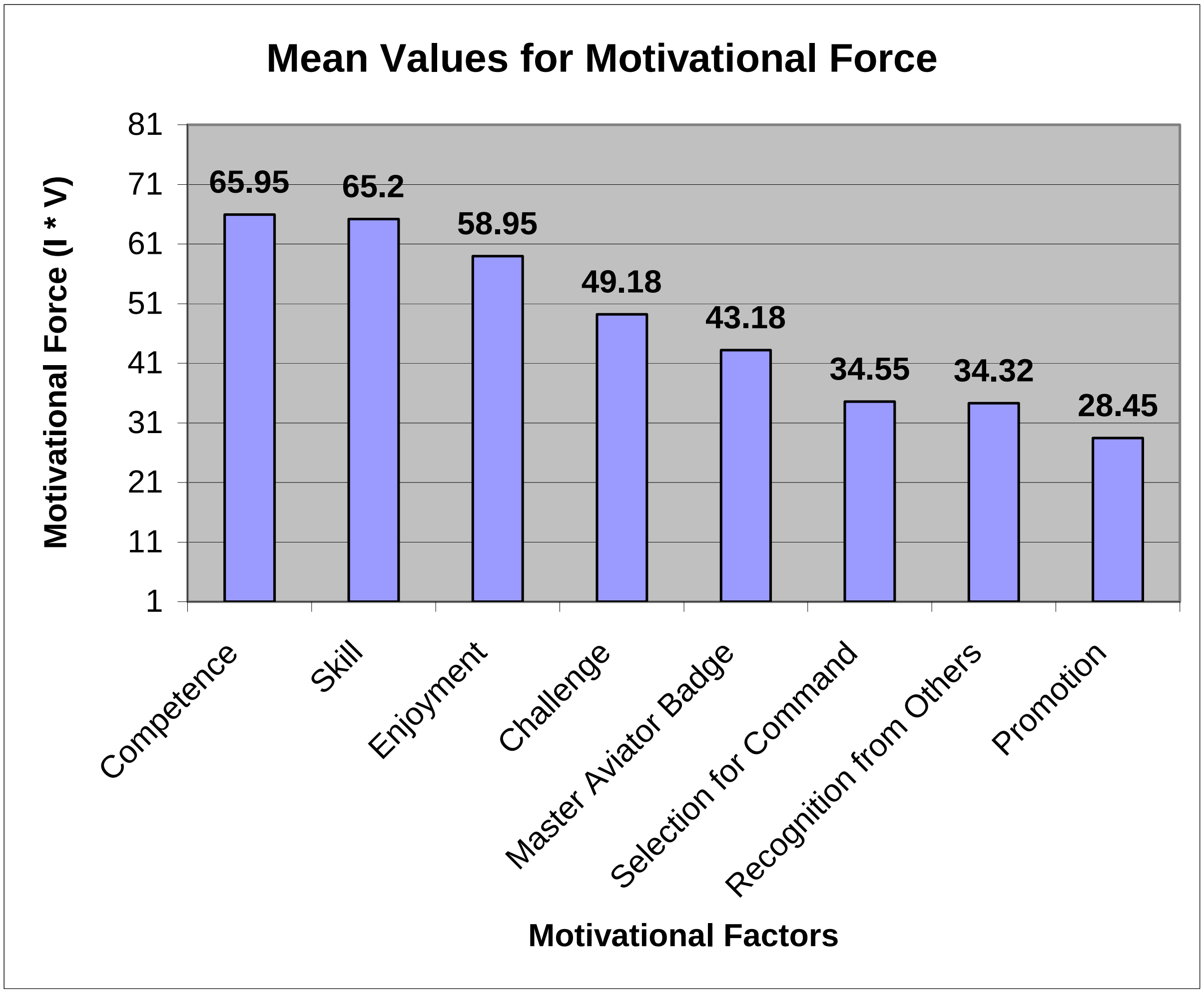

Figure 4.8, Motivational Force Mean Scores for Each Factor

Primary Statistical Analysis

Although the results from the descriptive analysis appeared to demonstrate that aviators are more motivated to gain flying experience due to intrinsic processes, the researcher conducted parametric statistical analysis (e.g., paired samples T-test) to verify this assertion. The researcher hypothesized that commissioned Army aviators were more intrinsically than extrinsically motivated to gain high levels of flying experience. Based on the results of the paired-samples t-Test procedure, this hypothesis was not rejected.

Specifically, the results indicated that the mean level of intrinsic motivation (*M* = 59.82, *SD* = 16.05) was significantly greater than the mean level of extrinsic motivation (*M*=35.13, *SD* = 15.02), $t(43) = 10.034$, $p < .001$. The standardized effect size index, *d*, was 1.51, a large value. The mean difference between intrinsic and extrinsic motivation was 24.70.

Additional Statistical Analysis

The results of hypothesis testing indicated that aviators were more intrinsically motivated than extrinsically motivated to gain flying experience. More precisely, aviators felt that gaining flying experience was instrumental in gaining intrinsic rewards such as a sense of competence, mastery of a skill, enjoyment, and an ability to deal with challenge. It was not clear, however, whether an aviator's intrinsic motivation to gain flying experience would contribute to their actual flying experience (both in terms of total flight hours and total hours logged as pilot-in-command). For example, since the results indicated that intrinsic motivation was more salient to aviators, and since earning the designation of pilot-in-command is considered an earmark of both competence and skill for Army aviators (see Quackenbush, 2000), would intrinsic motivation be predictive of an aviator's total hours logged as pilot-in-command?

Predicting Total Flight Hours

The first analysis sought to predict total flight hours (criterion variable) from intrinsic motivation, total months of operational flying duty credit, and total hours logged as a pilot-in-command (predictor variables). Results indicated that the linear combination of the predictor variables was significantly related to total flight hours, $F(4, 40) = 35.91$, *p* < .001. The sample correlation coefficient was .85 (Adjusted $R^2 = .71$), indicating that approximately 71% of the variance of total flight hours in the sample can be accounted for by the predictors. Of the three predictor variables, however, only pilot-in-command hours ($\beta = .66$, $p < .001$) and total months of operational flying duty ($\beta = .29$, $p = .006$) were statistically significant. The bivariate and partial correlations of the predictor variables with total flight hours are shown in Table 4.1.

Predicting Pilot-in-Command Hours

The second analysis sought to predict total hours logged as a pilot-in-command (criterion variable) from intrinsic motivation, total months of operational flying duty, and total flight hours (predictor variables). Results indicated that the linear combination of the predictor variables was significantly related to total pilot-in-command hours, $F(4, 40) = 28.06$, $p < .001$. The sample correlation coefficient was .82 (Adjusted $R^2 = .65$), indicating that approximately 65% of the variance of pilot-in-command hours in the sample can be accounted for by the predictors. Of the three predictor variables, however, only total flight hours ($\beta = .79$, $p < .001$) was statistically significant. The bivariate and partial correlations of the predictor variables with total pilot-in-command hours is shown in Table 4.2.

Table 4.1

Bivariate and Partial Correlations of the Predictors with Total Flight Hours

Predictors	Correlation between each predictor and total flight hours	Correlation between each predictor and total flight hours controlling for all other predictors
Intrinsic Motivation	-.04	.18
Total Operational Flying Duty Credit	.66**	.42*
Total Pilot-in-Command Hours	.82**	.72**

$* p < .01$, $** p < .001$

Table 4.2

Bivariate and Partial Correlations of the Predictors with Pilot-in-Command Hours

Predictors	Correlation between each predictor and total flight hours	Correlation between each predictor and total flight hours controlling for all other predictors
Intrinsic Motivation	-.14	-.18
Total Operational Flying Duty Credit	.57*	.05
Total Flight Hours	.82*	.72**

$* p < .01$, $** p < .001$

<u>Relative Importance of the Predictors</u>

Despite the significant results from each of the analyses, it was clear that the predictors were not equally influential. In both models, it appears as though intrinsic motivation contributed relatively little to the estimation of the criterion variables. For example, based on the squared partial correlations, only 3% of the variance that was left unexplained by the simple regression of total flight hours on pilot-in-command hours and total flight hours on total months of operational flying duty was explained by the addition of intrinsic motivation as a predictor variable. Contrasted with 52% of the variance estimated by pilot-in-command hours and 18% of the variance estimated by total months of operational flying duty when predicting total flight hours, the relative importance of intrinsic motivation in predicting total flight hours was marginal.

Although intrinsic motivation did not seem to contribute much in the way of predicting total flight hours, it appeared to be more important when predicting pilot-in-command hours. In fact, the least important predictor for pilot-in-command hours was total operational flying duty credit, explaining less than one percent of the variance. Intrinsic motivation, on the other hand, contributed 3% of the total variance associated with the prediction of pilot-in-command hours. Although this contribution may appear substantial, 52% of the variance in pilot-in-command hours was explained by the addition of total flight hours as a predictor variable. With this in mind, it appears that intrinsic motivation, although explaining some of the variance, is not as important as total flight hours in the prediction of pilot-in-command hours.

Summary of Findings

A sample of 44 commissioned Army aviators completed a survey that required them to provide demographic data (e.g., total flight hours, total hours logged as pilot-in-command, and total months of operational flying duty credit) and their responses to questions related to instrumentality and valence associated with gaining flying experience. For the instrumentality and valence questions, participants rated their subjective level agreement to questions related to four intrinsic rewards (e.g., competence, skill, enjoyment, and challenge) and four extrinsic rewards (e.g., promotion, selection for command, master aviator wings, and recognition from others). Instrumentality ratings were conceptualized as the relative influence that gaining a high level of flying had on gaining the rewards, while valence ratings were conceptualized as the relative importance that the participant placed on gaining the rewards.

The researcher conducted data analysis in three stages. First, descriptive statistics were generated for all of the responses. Second, the researcher conducted the paired samples t-Test procedure to test the hypothesis that commissioned Army aviators were more intrinsically motivated than extrinsically motivated to gain flying experience. Third, the researcher conducted two separate multiple regression analyses in order to predict the flying experience variables, namely total flight hours and total hours logged as pilot-in-command.

The results of these analyses demonstrated that there was a wide range of flying experience across the sample. Despite the variation in terms of total flight hours and total pilot-in-command hours, the participants indicated that gaining flying experience was most instrumental in gaining a sense of competence and skill and that these two rewards were most salient to them. The results of the paired samples t-test confirmed that participants were more intrinsically motivated to gain flying experience. Intrinsic motivation to gain flying experience, however, did not appear to translate into actual flying experience. Based on multiple regression analyses, intrinsic motivation was not a significant predictor of either total flight hours or total pilot-in-command hours. Instead, pilot-in-command hours and total operational flying duty explained a significant amount of the sample variance with respect to total flight hours. Total flight hours explained a significant amount of the sample variance with respect to pilot-in-command hours. The implications of these results are discussed in the following chapter.

CHAPTER 5

DISCUSSION AND RECOMMENDATIONS

The results of this study indicate that aviators are more intrinsically motivated than extrinsically motivated to gain flying experience. Aviators seem to feel that gaining flying experience is instrumental to gaining outcomes they value, particularly a sense of competence and skill. Intrinsic motivation, however, did not appear to be an important predictor of actual flying experience. Instead, it appears as though earning designation as pilot-in-command, and logging flight hours as such, is the best predictor of total flight hours. Similarly, accruing flight hours appears to be the best predictor of total pilot-in-command hours. Interestingly, although time spent serving in operational flying duty assignments is significantly related to gaining total flight hours, its contribution to predicting total flight hours is marginal, and its contribution to predicting pilot-in-command hours is virtually nonexistent. Stated another way, although serving in operational flying duty positions is the essential requirement for being able to gain flying experience, it does not appear to be a distinguishing factor in gaining this experience. With these issues in mind, there are implications that warrant discussion. As such, this chapter seeks to illustrate those implications with respect to self-development in general, and environmental constraints on an aviator's ability to engage in self-developmental activities, in particular. From these implications, recommendations will be offered.

Implications for Self-Development

As discussed within the literature review, self-developmental activities are the mechanism through which people gain and maintain competence, perfect skills, and continue to grow professionally. Not surprisingly, self-development is one of the three pillars of the Army's leader development program, in addition to professional military education and operational assignments. Since gaining flying experience, both in terms of total flight hours and in gaining designation as pilot-in-command, is discussed within the self-development rubric for Army aviators, the results demonstrate that commissioned Army aviators will be poised to engage in this self-development.

Intrinsic motivation is related to a worker's propensity to engage in self-developmental activities. For example, Maurer and Tarulli (1994) found that perceived benefits were related to participation in developmental activities, although inconsistently based on the type of benefit. In particular, a worker's intended and actual participation was related to intrinsic benefits, provided the worker valued those intrinsic benefits. With this in mind, it is not altogether surprising that Marshburn and Rollin (2005) asserted that Army aviators "should flourish in work settings where they are afforded the opportunity to feel competent in [their] flying skills" (p. 80). Clearly, the opportunity to gain flying experience can provide the sense of competence and skill that aviators value.

The implications of this study with respect to commissioned Army aviators engaging in self-development activities designed to enhance their flying skill and competence is fairly straightforward. Simply, just as the aviators expressed high motivational force for intrinsic rewards, they can be expected to respond favorably to the linguistic changes to their career development model. Specifically, they will likely strive to maintain a high degree of skill and competence in their aviator skills. Further, they will likely strive to earn designation as pilot-in-command based upon the competence that such a designation demands.

Implications of Barriers to Self-Development

Although commissioned Army aviators, due to their intrinsic motivation, will likely engage in self-development that provides the opportunity to gain a sense of competence and skill mastery, it seems somewhat counterintuitive that there was virtually no relationship between intrinsic motivation and flying experience. According to Patterson and colleagues (2004), "behaviour [*sic*] is a function both of a person's characteristics and the nature of his or her environment" (p. 193). Through this study, it is clear that intrinsic motivation, considered an individual differences trait-like variable (see Amabile et al., 1994), is a characteristic shared by commissioned Army aviators. Since all of these aviators serve under the same career development framework, it would follow that they would share essentially the same pattern of career progression, including gaining flying experience. As the results demonstrated, however, this was not the case. In fact, there was a widely disparate range of total flying hours and total pilot-in-command hours within the sample.

From the wide range of flying experience within the sample, it appears that some aviators were permitted the opportunity to engage in self-development associated with flying while others were not. Although self-development is conceived to be an individually initiated process, organizational conditions under which workers exist have the potential to either increase or decrease a person's participation in self-developmental activities. For example, while studying mid-grade Army officers, Boyce, Wisecarver, and Zaccaro (2005) found that a lack of support (e.g., from the Army, from the unit, or from a supervisor) often serves as a barrier to self-development. Like the present study, they also found that "there was little relationship between the motivation and abilities to self-develop a certain competency and the actual self-development of that competency" (p. 16).

Somewhat different from this study, however, Boyce et al. (2005) found that officers spent the most amount of self-development time on gaining and maintaining tactical and technical competence, as opposed to developing other skills such as teaching and counseling. In other words, although the officers they studied felt that developing those skills (e.g., teaching and counseling) was important, they chose to spend the majority of their time devoted to mastering the specific tasks associated with their occupational specialties within the Army. In the present study, however, it appears that many commissioned Army aviators have not enjoyed the luxury of focusing on their flying skills. In fact, 31% (n = 14) of the participants had never earned designation as pilot-in-command, the most frequently occurring response for total pilot-in-command hours.

Additionally, the wide range of responses involving past opportunities to fly illustrate that some of the aviators felt constrained in terms of gaining flying experience. This is not necessarily surprising since only 66% of the commissioned Army aviators across the Army are assigned to aviation assignments, and 38% of those assignments are considered generalist (e.g., non-flying) positions (Aviation Assignments Branch, 2005). Perhaps more important, the general level of disagreement with respect to having sufficient opportunities to fly in the future demonstrates that there may be tangible organizational barriers to self-developing flying experience facing commissioned Army aviators.

In looking at the consequences of organizational barriers to self-development, Tharenou (2001) examined how motivation explained participation in developmental activities, finding that "supervisor support is a key factor in an employee's participation in training and development" (p. 619). Simply, no matter how motivated a worker is to engage in self-development, if they do not have supervisor or organizational support, the likelihood of engaging in self-developmental activities will diminish. Accordingly, Tharenou suggested that supervisors should encourage employees to use those skills acquired through developmental activities.

Limitations

This study surveyed commissioned Army aviators attending the Command and General Staff Officer Course at Fort Leavenworth, Kansas and sought to extend previous research on the implications of Army aviators' motivation on organizational behavior. Although the research conformed to ethical and procedural standards established by the American Psychological Association (2005), there are some limitations that should be noted.

The purpose of scientific inquiry is to analyze sample data in order to generalize the findings to a larger population. In this case, the researcher studied a sample of commissioned Army aviators at Fort Leavenworth with the intent of generalizing the findings to commissioned aviators throughout the Army. Due to threats to external validity, particularly with respect to the sample, generalizing the findings must be approached with caution.

Only commissioned Army officers in the rank of Major participated in this study. Therefore, at best, the results of this study could be generalized only to the population of aviation branch officers of equal rank. Since the sample included participants attending an Army-mandated course of instruction, it stands to reason that the sample of aviators in this study would be fairly representative of the entire population of Aviation branch majors. As noted by Hadley and Mitchell (1995), "generalizing sample data to a meaningful population requires that the sample be representative of the population" (p. 266). For this study, the researcher administered the survey instrument to participants that were conveniently at hand (convenience sampling) without any randomization. Conducting convenience sampling, not surprisingly, seriously undermines the representativeness of the sample and "without respresentativeness, external validity is doubtful at best" (Hadley & Mitchell, p. 267).

Although convenience samples generally offer limited representativeness, the population of Army aviators, along with their primary aircraft specialty, is known (see Figures 3.1 and 3.2). The sample of aviators from this study, although not a perfect match, did resemble the population in terms of aircraft specialty (e.g., AH-64 (27%); CH-47 (9%); OH-58 (11%); UH-60 (48%); and fixed wing (2%)). This seemingly close match to population parameters, however, was a function of serendipity and not random sampling.

In addition to sampling issues that limit potential generalization of the findings, the sample was composed of volunteers. According to Hadley and Mitchell (1995), volunteers are not necessarily representative of the population from which they are drawn. In other words, there may be certain traits or tendencies that influence one person to volunteer while another refuses. For those that do volunteer, issues such as social desirability bias (e.g., a participant responding in such a manner to appear more experienced than they actually are) and response set (e.g., answering questions in some characteristic manner, such as all neutral responses, without regard to actual question content) may negatively affect the results. In this study, however, there were wide ranging responses for the demographic questions (involving both high and low levels of flying experience) and no response sets for the motivation questions were clearly obvious. With this, it appears that the responses were accurate and without bias. These effects, however, cannot be ruled out.

Finally, the sample size of 44 participants, although sufficient for the statistical analyses performed, was not large. Particularly when conducting multiple regression analysis, sample size guidelines when trying to generalize finding beyond a given sample should be sufficient in order to obtain a stable regression equation. Although there is much debate about how many participants are required, ranging from around 15 participants per predictor to 40 subjects per predictor, it is widely accepted that the more participants available, the more effective the analysis will be (Osborne, 2000). Although the multiple regression analyses conducted in this study contained only three predictor variables, the total number of participants constituted the minimum accepted number.

Recommendations

To ensure that commissioned Army aviators have sufficient opportunities to gain a high level of flying experience, it is important that they have organizational and supervisor support to do just that. More precisely, the Army should include policies that facilitate aviators' self-development associated with flying. The results of this study indicate that aviators possess the attributes associated with successfully engaging in self-developmental activities. Based on the wide range of flying experience within the sample, however, it appears that organizational barriers may exist. If this is the case, then these barriers will likely limit their participation in self-developmental programs with respect to maintaining their aviator skill and competence. It is not enough, however, to simply remove those barriers. For example, Farr and Middlebrooks (1990) asserted that removing barriers for participating in developmental activities does not necessarily lead workers to engage in developmental activities; positive factors associated with becoming competent, however, in addition to the removal of barriers to participation will (as cited in Tharenou, 2001). With this in mind, additional research is recommended for two reasons.

First, since gaining flying experience is important to the Army, it would be useful to conduct further inquiry to enhance the likelihood that the findings could be generalized to the entire population of Army aviators. Specifically, based on the ease of participation and the satisfactory reliability of the instrument used, it would be beneficial to conduct this study across the entire population of Army aviators. Through random sampling across the ranks, not only would a larger and more representative sample exist, but also more stable regression models could be developed. Second, additional research would allow for qualitative data, illustrating aviator experiences with respect to organizational barriers to self-development, if they do exist, to be revealed. By analyzing both quantitative and qualitative data, trends associated with gaining flying experience, both positive and negative, would become clear.

From the results of further inquiry, policy changes, if warranted, would be based on science. As with any self-developmental endeavor, including gaining flying experience, the activity should be initiated by the individual. Due to costs associated with gaining flying experience and the limited resources available, however, policy changes should only be adopted only if extensive research confirms its efficacy. The Army links aviator skill to overall leadership effectiveness, and therefore it is in the Army's best interest to determine whether or not issues undermining an aviator's ability to gain the desired levels of flying experience exist. Through conducting additional research and adopting policies that are suggested based on the results, the aviation leaders of tomorrow will be exactly the kind of leaders that are written about in the guidance of today.

APPENDIX A

FORT LEAVENWORTH QUALITY ASSURANCE OFFICE APPROVAL LETTER

ATZL-SWO

07 NOV 06

MEMORANDUM FOR: MAJ Todd H. Marshburn, CGSS, MMAS Student

SUBJECT: Request for Research: Why They Fly: An Analysis of the Factors that Motivate Army Aviators to Gain Flying Experience.

1. Your request to survey selected Army aviation students of the Command & General Staff College as part of your Master of Military Arts and Science program is:

■ **Approved**

☐ Approved with Conditions (see below)

☐ Denied (see below)

2. Your Survey Control Number (SCN) is **06-085.** This survey number must be clearly displayed on the front cover of your survey instrument's cover letter as illustrated below:

CGSC APPROVED SURVEY
SCN: 06-085
07 NOV 06

3. You are required to submit an *End of Project Data Collection Report* to the CGSC Quality Assurance Office when data collection for your project is complete. This report can be found at: http://cgsc.leavenworth.army.mil/QAO/download/End_Of_Data_Collection_Report.doc.

4. Should you have questions concerning the above, please contact Mr. Rick Steele in the CGSC Quality Assurance Office, room 226 Bell Hall, (913) 684-7261, DSN 552-7261.

CONDITIONS:

N/A

// Original Signed//

Ricky Steele
CGSC QAO
Survey Control

APPENDIX B

REQUEST FOR PARTICIPATION AND INFORMED CONSENT

Dear Army Aviator,

The purpose of this email is to request your participation in my research project entitled "Why They Fly: An Expectancy-Based Analysis of the Factors that Motivate Army Aviators." Participation in this project requires nothing more than answering a few questions and providing some demographic information. It should take no more than 10 minutes of your time and your responses will be kept confidential.

If you decide to participate in this research, please open the attached word document and complete the demographic information, indicate your responses to the 18 questions, and send the completed document to me via email at the following address: **todd.marshburn@us.army.mil**

This research is being conducted in partial fulfillment of the requirements for the Masters of Military Arts and Sciences degree at the Command and General Staff College, Fort Leavenworth, Kansas. The Quality Assurance Office of the Command and General Staff College approved this study and assigned it a survey control number of 06-085.

Prior to opening the survey document, please review the Informed Consent information below.

INFORMED CONSENT
I consent to participate in the research entitled "Why They Fly: An Expectancy-Based Analysis of the Factors that Motivate Army Aviators" conducted by Major Todd H. Marshburn.

I understand that my task in this research is to complete a questionnaire that provides demographic information as well as my evaluation of the influences of gaining flying experience. I am aware that although no physical or psychological harm is anticipated, I may withdraw from participating in this project at any time.

I acknowledge that my participation is free and voluntary. I understand the personal information I provide and the data collected will be used for research purposes only. All responses will be treated confidentially and will not be accessible to anyone outside the research team.

I understand that by completing the survey and returning it to Major Marshburn, I am consenting to participate in this study.

Thank you in advance for your participation.

Respectfully,

Todd H. Marshburn
MAJ, AV
CGSOC, Section 11B

APPENDIX C

SURVEY INSTRUMENT

QUESTIONNAIRE

PART I. **Please answer the following questions in the space provided:**

1. What is your current rank?	
2. What is your gender (M/F)?	
3. What is your age (in years)?	
4. How many years of Active Federal Service have you completed (in years)	
5. How many months of total operational flying duty credit have you earned (in months)?	
6. What is your primary aircraft? (e.g., AH-64; CH-47; OH-58; UH-60; Fixed Wing)?	
7. In Army aircraft, what is your total flight time, including SFTS (in hours)?	
8. In Army aircraft, what is your total Pilot-in-Command time, including PC, IP, MP, and UT (in hours)?	
9. To you, how much flight time equates to a high level of flying experience (in hours)?	
10. What is the highest position in which you expect to serve (e.g., primary battalion staff, primary brigade staff, battalion commander, brigade commander, general officer)?	

PART II. **Using the scale below, please indicate the number that best reflects your level of agreement for each item.**

1	2	3	4	5	6	7	8	9
Completely Disagree				**Neutral**				**Completely Agree**

1. To me, gaining a high level of flying experience is influential in obtaining…

Recognition from others.	1	2	3	4	5	6	7	8	9
The Master Aviator Badge.	1	2	3	4	5	6	7	8	9
Mastery of a Skill.	1	2	3	4	5	6	7	8	9
Promotion.	1	2	3	4	5	6	7	8	9
Ability to Deal with Challenge	1	2	3	4	5	6	7	8	9
Selection for Command.	1	2	3	4	5	6	7	8	9
Enjoyment	1	2	3	4	5	6	7	8	9
Sense of Competence.	1	2	3	4	5	6	7	8	9

2. Gaining the following is important to me:

Recognition from Others.	1	2	3	4	5	6	7	8	9
The Master Aviator Badge.	1	2	3	4	5	6	7	8	9
Mastery of a Skill.	1	2	3	4	5	6	7	8	9
Promotion.	1	2	3	4	5	6	7	8	9
Ability to Deal with Challenge	1	2	3	4	5	6	7	8	9
Selection for Command.	1	2	3	4	5	6	7	8	9
Enjoyment	1	2	3	4	5	6	7	8	9
Sense of Competence.	1	2	3	4	5	6	7	8	9

3. As you reflect on your career experiences, respond to the following:

So far in my Army career, I have had sufficient opportunities to fly.	1	2	3	4	5	6	7	8	9

4. As you think about your future in the Army, respond to the following:

In future assignments, I expect to have sufficient opportunities to fly.	1	2	3	4	5	6	7	8	9

Once completed with this survey, please email your responses to MAJ Marshburn at todd.marshburn@us.army.mil
Thank You for your Participation

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